

Stockpile Report to the Congress

April — September 1985



FEDERAL EMERGENCY
MANAGEMENT AGENCY



Federal Emergency Management Agency

Washington, D.C. 20472

The Honorable George Bush
President of the Senate

The Honorable Thomas P. O'Neill, Jr.
Speaker of the House of Representatives

Sirs:

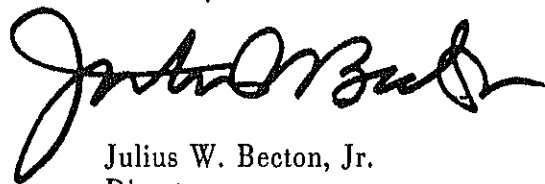
This Stockpile Report to the Congress is submitted in accordance with Section 11 of the Strategic and Critical Materials Stock Piling Act, as amended.

The Stock Piling Act provides that strategic and critical materials be stockpiled in the interest of national defense to preclude a dangerous and costly dependence upon foreign sources of supply in times of national emergency and establishes the National Defense Stockpile for that purpose.

By Executive Order 12155, the President delegated to the Director of the Federal Emergency Management Agency the policy implementation and planning activities for the National Defense Stockpile under the Stock Piling Act.

This report covers operations of the National Defense Stockpile during the April-September 1985 period.

Sincerely,



Julius W. Becton, Jr.
Director

INTRODUCTION

This report is prepared in accordance with Section 11 of the Strategic and Critical Materials Stock Piling Act (P.L. 96-41, 50 U.S.C. 98 *et seq.*). The report covers stockpile program activities occurring during the period from April 1, 1985 through September 30, 1985. The organization of the report is designed to present the information required to be reported by the Act which includes:

- (1) information with respect to foreign and domestic purchases of materials during the preceding 6-month period;
- (2) information with respect to the acquisition and disposal of materials by barter pursuant to Section 6(c) of the Act, during such period;
- (3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the Fund during the next fiscal year; and
- (4) such other pertinent information on the administration of the Stock Piling Act as will enable the Congress to evaluate the effectiveness of the program provided for under the Act and to determine the need for additional legislation.

Consistent with these statutory requirements, this report is divided into four major sections:

- I. Stockpile Acquisition and Disposal Program;
- II. Stockpile Barter Program;
- III. Financial Status of the National Defense Stockpile Transaction Fund; and
- IV. Administration of the Stockpile Program.

Appendixes present detailed information on:

- The current inventory of materials in the National Defense Stockpile, with a key to abbreviations used in quantity measures and a description of materials offsets;
- An explanation of calculation procedures for family groupings of stockpile materials, including a listing of conversion factors;
- Reference copies of the Strategic and Critical Materials Stock Piling Act of 1979, as amended, and Executive Order 12155, as amended; and
- A reference copy of the White House Press Release dated July 8, 1985, detailing the Administration's proposed changes in National Defense Stockpile policy.

CONTENTS

INTRODUCTION	ii
HIGHLIGHTS	iv
I. STOCKPILE ACQUISITION AND DISPOSAL PROGRAM	1
Acquisitions of Goal Materials	1
Disposals of Excess Inventory	1
II. STOCKPILE BARTER PROGRAM.....	3
III. FINANCIAL STATUS OF THE NATIONAL DEFENSE STOCKPILE TRANSACTION FUND.....	5
IV. ADMINISTRATION OF THE STOCKPILE PROGRAM.....	9
Overview	9
Annual Materials Plan.....	9
Legislation.....	9
Research and Development	12
Property Management	19
Ferroalloy Upgrading Program	20
Status of the Stockpile Inventory	21
Purchase Specifications.....	25

APPENDIXES

Appendix 1. National Defense Stockpile Inventory	27
Appendix 2. Calculation Procedure for Family Groupings of Materials .	33
Appendix 3. The Strategic and Critical Materials Stock Piling Act	35
Appendix 4. Executive Order 12155, Strategic and Critical Materials ...	41
Appendix 5. White House Press Release dated July 8, 1985— National Defense Stockpile Policy	43

HIGHLIGHTS

I. STOCKPILE ACQUISITION AND DISPOSAL PROGRAM

- There were no purchases funded from the National Defense Stockpile Transaction Fund during the report period. Jewel bearings valued at \$778,000 were acquired for the Stockpile under separate appropriation.
- Sales contracts totaling \$7.9 million were signed covering disposals of 12 excess stockpile materials; quantities of 4 excess stockpile materials with a total value of \$22.7 million were transferred in payment for services under the ferroalloy upgrading program

II. STOCKPILE BARTER PROGRAM

- There were no new barter agreements negotiated during the report period.

III. FINANCIAL STATUS OF THE NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

- Total receipts of \$801.7 million have been credited to the National Defense Stockpile Transaction Fund since its inception in 1979.
- Obligations totaling \$367.5 million have been made from the Transaction Fund to acquire materials for the Stockpile.
- The balance in the Transaction Fund, as of September 30, 1985, was \$434.2 million, all of which has been authorized by Congress for purchases of materials for the Stockpile.

IV. ADMINISTRATION OF THE STOCKPILE PROGRAM

- The inventory in the Stockpile as of September 30, 1985, is valued at \$10.0 billion, of which \$6.9 billion is held against stockpile goals. Current stockpile goals would require \$16.6 billion of materials. To meet current goals an additional \$9.7 billion of materials would be required.
- Two bills affecting the Stockpile were signed into law during the report period:
 - Public Law 99-61, provides for the use of silver from the National Defense Stockpile for the issuance of coins.
 - Public Law 99-88, provides that no reductions in stockpile goals may be made until October 1, 1986.
- Under the ferroalloy upgrading program, approximately 262,643 short tons of chromite ore and 136,280 short tons of manganese ore have been shipped out of inventory for upgrading, and a total of 98,516 short tons of ferrochromium and 66,176 short tons of ferromanganese have been received back into inventory in return.
- The White House issued a Press Release on July 8, 1985, announcing proposed new goals and policies for the National Defense Stockpile.

I. STOCKPILE ACQUISITION AND DISPOSAL PROGRAM

Acquisitions of Goal Materials

No acquisitions of goal materials were funded from the National Defense Stockpile Transaction Fund during the report period. A moratorium had been placed on such acquisitions pending completion of the Stockpile/Industrial Mobilization Planning Study by the National Security Council. There were no acquisitions by barter or exchange.

The U.S. Government-owned William Langer Jewel Bearing Plant located at Rolla, North Dakota, pro-

duces jewel bearings for sale to the National Defense Stockpile and defense contractors. The cost for jewel bearings acquired for the Stockpile is not included in Transaction Fund accounts because the bearings are funded under a separate program appropriation. During the report period, 577,761 jewel bearings were ordered for the Stockpile at an estimated total value of \$778,000.

Figure 1
Acquisitions of Stockpile Materials
April 1, 1985-September 30, 1985

Material	Unit	Quantity	Cost	Origin
Stockpile Transaction Fund				
New Acquisitions			-0-	
Total Obligations From Transaction Fund			\$ -0-	
Other				
Jewel Bearings	PC	577,761	\$ 778,000	Domestic
Total Cost of Materials			\$ 778,000	

Disposals of Excess Inventory

On September 24, 1985, the General Services Administration (GSA) announced suspension of the offering for sale of excess materials from the National Defense Stockpile beginning October 1, 1985. The action was taken in compliance with restrictions in Section 5(b) of the Strategic and Critical Materials Stock Piling Act enacted by the Congress in 1984. These restrictions prohibit such sales when

the unobligated balance in the National Defense Stockpile Transaction Fund exceeds \$250 million. At the close of business on September 30, 1985, the statutory limitation was exceeded.

Disposals for cash of excess Stockpile materials will not take place until the statutory restriction is revised or the unobligated balance in the Fund totals less than \$250 million. Other disposals of excess materials from the Stockpile, however, will still be

permitted when they are transferred, in accordance with Section 6(c) of the Stock Piling Act, at fair market value as payment for expenses of acquisitions of goal materials, or of refining, processing, or rotating materials in the Stockpile. During the report period such transfers were made under the ferroalloy upgrading program.

As detailed in figure 2, disposals of excess Stockpile materials totaled \$30.5 million during the report period. Of that value, cash sales totaling approximately \$7.9 million were made from disposal of 12 excess Stockpile materials. Disposals of 4 excess Stockpile materials totaling \$22.7 million in value were also made in support of the Presidentially-directed ferroalloy upgrading program. The latter disposals involved industrial diamond stones, mercury, tin, and tungsten.

Figure 2
Disposals of Excess National Defense Stockpile Materials
April 1-September 30, 1965

Material	Unit	Value	Quantity	Balance of Disposal Authority (Quantity)
Cash Sales				
Antimony	ST	\$ 1,458,375	588	2,203
Asbestos, Chrysotile	ST	—	—	5,600
Diamond, Industrial, Stones	KT	1,265,435	250,881	8,748,729 *
Manganese Dioxide, Battery Grade, Natural Ore	SDT	320,000	4,000	47,210
Manganese Ore, Metallurgical Grade	SDT	—	—	292,000
Mercuric Oxide	LB	764,510	244,976	29,125 *
Mercury	FL	434,878	1,504	1,918 *
Mica, Muscovite Film, 1st & 2nd Qualities	LB	7,575	2,500	997,500
Mica, Muscovite Splittings	LB	—	—	81
Mica, Phlogopite Splittings	LB	—	—	0
Quartz Crystals	LB	50,963	35,530	0
Silver	TR OZ	—	—	10,000,000
Talc, Biscuit Block & Lump	ST	—	—	83
Thorium Nitrate	LB	25,000	10,000	40,000
Tin	MT	968,793	80	17,819 *
Tungsten Ores & Concentrates	LB W	1,119,279	296,680	1,550,274 *
Vegetable Tannin Extract, Chestnut	LT	181,213	241	3,308
Vegetable Tannin Extract, Quebracho	LT	1,248,867	1,833	16,485
Total Cash Sales During Period		\$ 7,651,661		
Ferroalloy Upgrading Program Expenses				
Diamond, Industrial, Stones	KT	\$ 3,659,525	748,100	6,002,829
Mercury	FL	570,771	1,918	0
Tin	MT	15,378,883	1,225	16,694
Tungsten Ores & Concentrates	LB W	3,078,703	638,917	720,357
Total Disposals for Upgrading		\$22,685,882		
Total Disposals		\$30,337,543		

* Additionally reduced by ferroalloy upgrading program, see entry in that section for final balance for period

Disposals of the five materials described below accounted for over 90 percent of the total disposals during the period.

continued
metal
the

previous period to total 588 short tons, valued at \$1.5 million. Moderate improvement is expected in the antimony market as consumption levels are expected to increase for antimony oxide in flame retardants, the dominant market for primary antimony.

Industrial diamond stones: Excellent responses to offerings continued during this report period as the rate of disposals more than doubled over the previous period. Cash sales of 259,173 carats yielded \$1.3 million for the Transaction Fund. In addition, 746,100 carats, valued at \$3.6 million were disposed of in payment of costs of the ferroalloy upgrading program. The average cash sales price of \$3.97 per carat reflects a continuing policy of disposing first of the lowest quality of excess inventory.

Tin: Responding to a softness in the market, cash sales of tin from the Stockpile declined by over 75 percent from the previous period. Sales totaling 80 metric tons resulted in \$1.0 million accruing to the Transaction Fund during the report period. A total of 1,225 metric tons was disposed of as payment for the ferroalloy upgrading program, at a value of \$15.4 million. Tin was the preferred payment material for that program during this report period.

Tungsten ores and concentrates: Total disposals of tungsten from the Stockpile doubled over the previous period to total 1,137,597 pounds of contained tungsten, valued at \$4.2 million. Cash sales from the Stockpile totaled 298,680 pounds, valued at \$1.1 million. In addition, a total of 838,917 pounds was transferred to help finance the cost of the ferroalloy upgrading program at a value of \$3.1 million. Some modest demand improvement was seen in the tungsten market from the previous two years. However, this recovery has been impacted strongly by the availability of supplies and the aggressive marketing efforts by some foreign producers in selling upgraded tungsten.

Vegetable tannin, quebracho: Domestic demand for vegetable tannin, quebracho, remained stable. Sales of vegetable tannin from the Stockpile increased slightly during this reporting period to 1,833 long tons, valued at \$1.2 million.

II. STOCKPILE BARTER PROGRAM

Between 1950 and 1967, the U.S. Department of Agriculture (USDA) conducted a barter program under which 60 strategic and critical materials, with a value of more than \$1.6 billion, were acquired from more than 50 different countries. These materials were bartered for agricultural commodities owned by the Commodity Credit Corporation (CCC), USDA. The last barter contract under that program was signed in 1967.

The acquisition of strategic and critical materials for the Stockpile by GSA from CCC has been on a case-by-case basis, with the question of reimbursement handled as a part of the normal budget process. In the past, transfers of bartered materials to the Stockpile have been made either without reimbursement by GSA to CCC or with deferred reimbursement at the value of the bartered agricultural commodities.

On January 17, 1984, the Emergency Mobilization Preparedness Board (EMPB) was tasked by the President as the senior body to review barter proposals or policies. The U.S. policy on barter will

continue to be as stated in the President's National Materials and Minerals Program Plan and Report to Congress, dated April 5, 1982;

The Administration will rely primarily upon purchases on the open market to build the nation's stockpile...We will use exchanges and barter to acquire additional stockpile materials when in the best interests of the country.

On February 8, 1985, the President's Report to Congress pursuant to Section 904 of Public Law 98-525 reiterated that policy and clarified that barter and exchange would be used to acquire stockpile materials "in cases where it is more efficient and effective than open market transactions or when in the best interest of the country."

There were no new barter agreements negotiated during the report period. In addition, the Interagency Barter Working Group of the EMPB terminated consideration of one proposal to exchange an excess Stockpile material for a needed goal material.

III. FINANCIAL STATUS OF THE NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

Proceeds from the sale of excess stockpile materials are placed in the National Defense Stockpile Transaction Fund established under Section 9 of the Strategic and Critical materials Stock Piling Act. The disposal sales of excess materials from inception of the Fund in Fiscal Year 1979 through September 30, 1985, have a total value of \$437.7 million, as detailed in Figure 3. Receipts from all sources covered into the Fund have totaled \$801.7 million. This total consists of proceeds from disposal sales of excess stockpile materials plus

monies transferred to the Transaction Fund from earnings from naval petroleum reserves pursuant to Public Law 98-525. The petroleum reserve transfers totaled approximately \$206.1 million during the report period. Sales of excess materials prior to July 30, 1979, for which the proceeds were received after that date, and adjustments due to over and under shipments of disposal contracts, account for the difference between receipts from disposals and sales dollars.

Figure 3
Cumulative Disposal Sales of Excess Stockpile Materials
July 30, 1979-September 30, 1985

Material	Unit	Quantity	Value
Antimony	ST	2,881	\$ 5,313,623
Asbestos, Chrysotile	ST	1,000	1,493,830
Celestite	SDT	1,000	1,000
Diamond, Industrial, Crushing Bort	KT	2,375,123	5,196,183
Diamond, Industrial, Stones	KT	6,711,554	81,128,723
Kyanite	SDT	300	30,000
Iodine	LB	640,688	3,582,889
Magnesium	ST	362	763,820
Manganese Dioxide, Battery Grade, Natural Ore	SDT	56,159	4,231,925
Manganese Ore, Chemical Grade	SDT	49,238	3,991,986
Mercuric Oxide	LB	643,175	1,917,648
Mercury	FL	17,172	5,614,575
Mica, Muscovite Film, 1st & 2nd Quality	LB	102,326	347,616
Mica, Muscovite Splittings	LB	6,941,036	4,580,637
Mica, Phlogopite Splittings	LB	1,299,555	1,189,322
Quartz Crystals	LB	613,553	1,908,033
Rare Earth Oxides	SDT	702	533,000
Rubber	LT	646	469,343
Silver	Tr Oz	2,000,000	18,123,325
Talc, Steatite Block & Lump	ST	10	4,000
Thorium Nitrate	LB	36,875	88,599
Tin	MT	14,184	200,791,321
Tungsten Ores & Concentrates	LB W	11,568,460	77,920,117
Vegetable Tannin Extract, Chestnut	LT	4,885	3,210,162
Vegetable Tannin Extract, Quebracho	LT	22,431	14,302,049
Vegetable Tannin Extract, Wattle	LT	1,350	940,749
Total Sales Since July 30, 1979			\$437,674,475

A total of \$367.5 million has been obligated from the National Defense Stockpile Transaction Fund through September 30, 1985, to finance the pur-

chase of needed Stockpile materials from numerous world sources. The cumulative obligations are shown in Figure 4.

Figure 4
Cumulative Obligations from the National Defense Stockpile Transaction Fund
July 30, 1979-September 30, 1985

Material	Unit	Quantity	Cost	Origin
Bauxite, Metallurgical Grade	LDT	3,600,000	\$122,484,419	Jamaica
Bauxite, Refractory	LCT	100,327	15,057,406	China
Beryllium	LB	120,000	27,918,712	Domestic
Cobalt	LB	12,200,000	119,620,366	Various a/
Iridium	Tr Oz	12,600	4,676,897	South Africa
Nickel	ST	5,000	24,266,864	Canada, Norway
Palladium	Tr Oz	9,600	1,322,741	South Africa
Quinidine	Av Oz	671,983	2,520,411	Netherlands
Rubber	LT	6,890	7,070,059	Various b/
Tantalum Minerals	LB Ta	282,883	11,548,032	Various c/
Titanium Sponge	ST	4,500	29,327,317	Various d/
Vanadium	ST V	181	1,679,962	Domestic
Total Obligations			\$367,502,707	

a/ Canada, Zaïre, and Zambia.

b/ Malaysia, Indonesia, and Thailand.

c/ Brazil, Australia, Germany, Thailand, the Netherlands, Zaïre, Mozambique, Nigeria, Malaysia, Canada, Rwanda, Zimbabwe, South Africa, Namibia, Singapore, Spain, Portugal, China, and Argentina.

d/ Japan, United Kingdom, and the United States.

The financial status of the National Defense Stockpile Transaction Fund from its inception is summarized in Figure 5. A total of \$583.3 million has been authorized by Congress to be obligated for the purchase of materials for the Stockpile. A total of \$367.5 million has been obligated for the purchase of materials and related expenses. As of

September 30, 1985, the balance in the Transaction Fund available for future purchases was \$434.2 million. Of this amount, obligational authority exists for \$215.8 million. Estimates of anticipated appropriations for Fiscal Year 1986 are not available at this time.

Figure 5
Financial Status of the National Defense Stockpile Transaction Fund
July 30, 1979-September 30, 1985
(Millions of Dollars)

Period	Receipts	Purchase		Unobligated Balance in Fund (End Date)
		Authority	Obligations	
August 1, 1979 to September 30, 1979	\$ 7.3	0	0	\$ 7.3
October 1, 1979 to September 30, 1980	87.0	0	0	94.3
October 1, 1980 to September 30, 1981	99.2	\$100.0 0.4a/	\$78.0	115.5
October 1, 1981 to September 30, 1982	161.0	57.6 0.3b/	44.0	232.5
October 1, 1982 to September 30, 1983	53.2	120.0	145.0	140.7
October 1, 1983 to September 30, 1984	51.0	120.0	108.9 (17.4)c/	100.2
October 1, 1984 to September 30, 1985	343.0d/	185.0	9.3 (.3)e/	434.2
Totals	\$801.7	\$583.3	\$367.5	

a/ Consists of approximately \$400,000 in authority for the rotation of rubber under Section 6(a)(4) of the Stock Piling Act.

b/ Consists of approximately \$300,000 in authority for the rotation of chrysotile asbestos under Section 6(a)(4) of the Stock Piling Act.

c/ The amount of \$17,387,000 was deobligated during the reporting period to effect adjustments to previously reported obligations for transportation costs on the bauxite purchase and the bauxite barter agreement.

d/ Includes an estimated \$302.2 million from earnings from naval petroleum reserves pursuant to Public Law 98-525.

e/ The amount of \$333,000 was deobligated during the reporting period to effect adjustments to previously reported obligations for sampling and analysis, and other related costs.

IV. ADMINISTRATION OF THE STOCKPILE PROGRAM

Overview

The Strategic and Critical Materials Stock Piling Act provides that a stock of strategic and critical materials is to be maintained to decrease dependence upon foreign sources of supply in times of national emergency. Executive Order 12155 vests the responsibility for planning the stockpile program in the Director of the Federal Emergency Management Agency (FEMA).

The Stock Piling Act requires that the stockpile inventory be sufficient to cover U.S. needs for not less than 3 years of a national emergency. The President approves stockpile policy guidance assumptions regarding changes in a wartime civil economy, wartime foreign trade patterns, shipping losses, wartime political and economic stability of foreign nations, and foreign and domestic production levels for stockpile materials.

These guidelines are followed in determining the stockpile goals which represent the difference between estimated supply and projected requirements for each strategic material. Periodic review and updating of the goals are required to ensure a current estimate of our Nation's vulnerability to resource shortages during an emergency.

Stockpile Study

An interagency stockpile study was completed during the report period. Results of this study, along with new goals proposed by the Administration for the Stockpile, were announced in a news release issued by the White House on July 8, 1985. The study group was chaired by the National Security Council. A copy of the news release is included as Appendix 5. A number of briefings on the Administration's proposal have been conducted for Members of Congress and congressional staff members during the report period.

ANNUAL MATERIALS PLAN

Pursuant to Section 11(b) of the Strategic and

Critical Materials Stock Piling Act, the management plan for restructuring the inventory of the stockpile is provided through the development of the Annual Materials Plan (AMP). The AMP is the product of a major interagency effort that develops an annual list of acquisition and disposal actions for stockpile materials. The AMP is developed in a manner that balances National Defense Stockpile requirements against the need to avoid undue market disruption and to conform with budget limitations.

The AMP is submitted by the Director of FEMA to the Committees on Armed Services of the Senate and the House of Representatives. Any revisions to the initial AMP each year are similarly developed and, in accordance with Section 5(a)(2) of the Stock Piling Act, are submitted to Congress by the Director of FEMA when changed market conditions or other factors require such action.

During the report period, there were no revisions to the Fiscal Year 1985 AMP.

LEGISLATIVE ACTIVITIES

Enacted Legislation

During the report period, two bills directly affecting the National Defense Stockpile program were passed by the Congress and signed into law by the President.

Public Law 99-61. Title I of this statute provides that the Secretary of the Treasury shall obtain through purchase from the National Defense Stockpile up to approximately 7.7 million troy ounces of silver for the issue of up to ten million one-dollar coins. Title II requires purchase of silver from the Stockpile for minting Liberty Coins to meet public demand after sale of Title I coins or September 1, 1986, whichever is earlier.

Public Law 99-88 (Supplemental Appropriations Act, Fiscal Year 1985). Chapter XI of this statute contains the following provision, introduced as an

amendment by Mr. McClure (R-Idaho), on the National Defense Stockpile: No reductions in stockpile goals may be made below those in effect on October 1, 1984, by the President under authority provided by the Strategic and Critical Materials Stock Piling Revision Act of 1979 (98 Stat. 319), as amended, until October 1, 1986, unless authorized by Act of Congress.

Other Actions

Other bills (H.R. 1872 and S. 1160) affecting the National Defense Stockpile were introduced during the report period and considered in the development of the Department of Defense Authorization Act, Fiscal Year 1986. Final action was not taken on this proposed legislation during the report period.

H.R. 1872 was introduced on April 2, 1985, and referred to the House Committee on Armed Services. The bill included the following provisions:

- During Fiscal Year 1986 and subsequent years 30 percent of the net proceeds of the Naval Petroleum Reserves would be covered into the National Defense Stockpile Transaction Fund.
- Disposals for cash of excess materials in the National Defense Stockpile would be prohibited if the balance in the Stockpile Transaction Fund exceeds \$250 million in Fiscal Year 1987, and subsequent years.

S. 1029 was introduced on April 29, 1985, and referred to the Senate Committee on Armed Services. S. 1029 included the following provisions:

- Additional authority would be provided to dispose of quantities of 21 excess materials from the National Defense Stockpile.

During Fiscal Year 1986, 30 percent of the net proceeds of the Naval Petroleum Reserves would be deposited into the National Defense Stockpile Transaction Fund.

Provisions pertaining to the National Defense Stockpile in S. 1029 were incorporated into S. 1160, which was reported out of the Committee on

Armed Services on May 16, 1985, and was passed by the Senate on June 5, 1985. S. 1160, as amended, was passed by the House of Representatives on June 27, 1985. A Conference Report (H. Rept. No. 99-235) on S. 1160 was issued on July 29, 1985, and was agreed to by the Senate on July 30, 1985. As of September 30, 1985, the House of Representatives had not agreed to H. Rept. No. 99-235 which contains in Sections 1611 and 1612 the following provisions on the National Defense Stockpile:

- During Fiscal Year 1986, 30 percent of the net proceeds of the Naval Petroleum Reserves would be deposited into the National Defense Stockpile Transaction Fund.
- Sales from the stockpile would be prohibited if the balance in the Stockpile Transaction Fund exceeds \$250 million in Fiscal Years 1986 and 1987 and \$100 million thereafter.
- No action may be taken before October 1, 1986, to implement or administer any change in a stockpile goal in effect on October 1, 1984, that results in a reduction in the quality or quantity of any strategic and critical materials to be acquired for the National Defense Stockpile.
- A stockpile goal was defined as a determination made by the President under Section 3(a) of the Strategic and Critical Materials Stock Piling Act (50 U.S.C. 98b) with respect to the National Defense Stockpile.

Section 1613 of the Department of Defense Authorization Act, Public Law 99-145, also requires the Secretary of Defense to conduct a study to determine what effect the loss of all capacity by the United States to produce domestic ferroalloys would have on the defense industrial base and on industrial preparedness of the United States. The study shall be conducted through the Under Secretary of Defense for Policy in consultation with the Director of the Federal Emergency Management Agency and the Secretary of the Interior and shall be submitted no later than 180 days after the date of enactment of the Act.

Title II of H.R. 3036 (Treasury, Postal Service, and General Government Appropriations, Fiscal Year

1986), introduced during the report period, includes an amendment which appropriates \$15 million to be used for a grant to construct a mines building at the Mackay School of Mines of the University of Nevada; relocate the Generic Center on Recycling of Strategic Metals; and establish the Policy Center on Strategic Materials.

S. 1155, a bill to authorize the disposal of 10 million troy ounces of excess silver from the National Defense Stockpile, was introduced by Congressman Chafee and referred to the Committee on Armed Services.

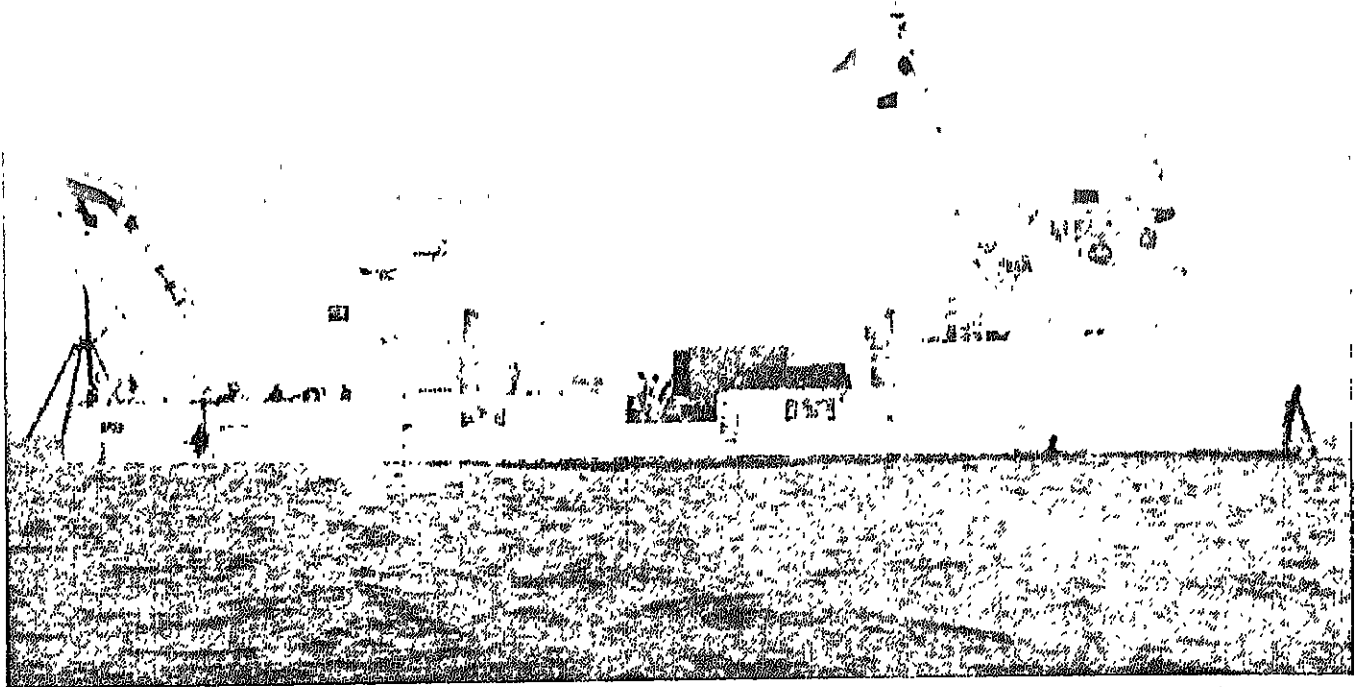
Companion bills, S. 1295 and H.R. 3207 (both entitled the Silver and Gold Bullion Coin Act), were introduced during the report period to provide for the minting of gold and silver bullion coins. Both bills allowed the Secretary of the Treasury to obtain silver from any federally-owned stocks of silver [including the National Defense Stockpile].

On June 24, 1985, the Subcommittee on Seapower and Strategic and Critical Materials of the Committee on Armed Services of the U.S. House of Representatives met in executive session to receive a classified briefing on the National Security Council study of stockpile goals.

RESEARCH AND DEVELOPMENT

Minerals Exploration: Potentially significant offshore concentrations of minerals were discovered by the U.S. Geological Survey (USGS). Submarine mineral deposits off the U.S. Atlantic coast were the focus of a USGS research cruise in June 1985. The research vessel, John Wesley Powell, see photo, outfitted with a modern marine navigation and data-acquisition system, departed Fort Lauderdale, Florida, on June 3 with a team of eight USGS scien-

tists to survey and sample Atlantic Continental Shelf sediments for high concentrations of placer heavy minerals, including titanium minerals and zircon. The Powell returned to Washington, D.C., on June 28 after completing sampling and geophysical measurements along the coasts of Florida, Georgia, South Carolina, North Carolina, and Virginia.



U.S. Geological Survey research vessel Powell during June 1985 coring operations on the continental shelf to determine thickness of sands containing concentrations of heavy minerals. The coring device is lowered from the A frame boom at the stern of the ship (left side of photo).

Preliminary results from the initial onboard analysis of samples, including concentrates processed at sea, suggest concentrations of at least 3 to 10 percent heavy minerals, including ilmenite (iron-titanium oxide) and zircon (zirconium silicate), are present at locations offshore of Virginia and Georgia. Core samples, see photo, indicate that these concentrations are continuous, vertically, to a depth of at least ten feet. In the Virginia offshore area, arrays of cores taken over submarine geomorphic features where high concentrations of heavy minerals were found indicate horizontal as well as vertical continuity. A total of 60 core samples and 72 grab samples were acquired during the Powell cruise. In addition to conventional geophysical data collection (high-resolution seismic reflection and side-scan sonar profiling) to determine bottom topography, a test was made of a "streamer" towed behind the ship for induced polarization geophysical measurements designed to detect ilmenite occurrences.

Target areas for the sampling were identified from pre-cruise analysis of heavy minerals in over 500 samples from the sample collections that USGS and other researchers have catalogued from previous investigations. At this time in offshore placer research, researchers are beginning to identify patterns in seafloor morphology and sediment character. These patterns indicate that concentrations of heavy minerals on the Atlantic Inner Continental Shelf are related to a number of geologic factors including location and drainage areas of present and past river systems, location of former shorelines, the rate of change in sea level, and coastal processes. Present studies are designed to compare and relate the description of submarine placer deposits to onshore placer deposits of titanium minerals such as those in Florida, Georgia, and New Jersey, where mining has been done.

Other recent USGS mineral-resource projects in the 200-mile coastal Exclusive Economic Zone (EEZ)



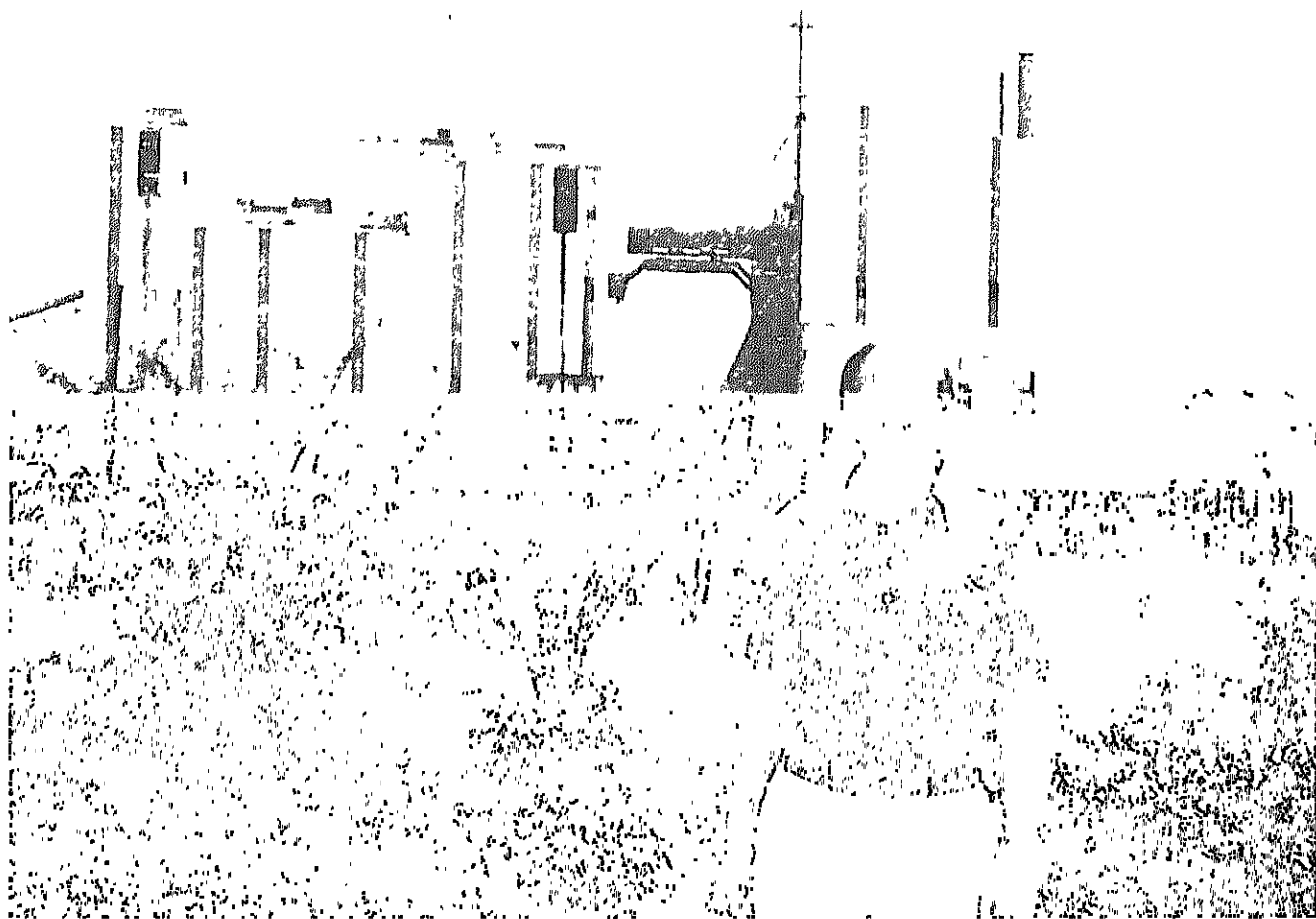
Dr. Jeffrey Wynn, geophysicist, and Ms. Cristina Lief, physical science aide, both of the U.S. Geological Survey, perform induced polarization geophysical tests on sediment core (tube under Wynn's right knee) during June 1985 cruise off eastern U.S. seaboard.

declared by the President on March 10, 1983, include reconnaissance mapping of nearly 150,000 square miles of seafloor in the deeper waters of the Gulf of Mexico. The project is expected to produce basic seafloor "road maps" that will serve for the next several decades to guide resource assessments as well as hazard investigations in that area. In the late summer of this year, the USGS research vessel S. P. Lee sampled sulfide minerals and heat flow of the volcanic Juan de Fuca Ridge off the Oregon coast.

The Minerals Management Service (MMS) of the Department of the Interior is studying the feasibility of leasing cobalt-rich manganese crusts in the Hawaiian and Johnston Island Exclusive Economic Zone (EEZ). During 1985, the German research vessel, *Sonne*, with authorization from the U.S. Department of State, and in cooperation with the USGS and MMS, investigated the occurrence and distribution of crusts in the vicinity of Johnston Island, located about 700 miles southwest of the Island of Hawaii. The University of Hawaii research vessel, *Moana Wave*, under the sponsorship of the MMS, also investigated potential mine sites for cobalt crusts on the Cross Seamount located about 100 miles west of the Island of Hawaii. Crust resources found to date at the most prospective mining sites contain 1 percent cobalt, 0.5 percent nickel, and traces of platinum (up to 1.2 grams per ton). The distribution and occurrence of crust resources in the EEZ of the U.S. Trust and Affiliated Territories in the Pacific are described in a 1985 report prepared by the East-West Center Resource Systems Institute for the MMS. An environmental impact statement is currently being prepared for the possible leasing of cobalt-rich manganese crusts in the Hawaii and Johnston Island EEZ. The MMS is also studying the possibility of leasing polymetallic sulfide deposits containing copper, zinc, and iron on the Gorda Ridge located offshore Oregon and northern California. This is being accomplished through a cooperative research program that involves the participation of the USGS, National Oceanic and Atmospheric Administration, Oregon State University, and several other Federal and State agencies.

Problems of providing useful mineral-resource information for land-use planners were the focus of a September 1985 workshop on "Metals on Public Lands—Assessments for Policy Development" held at Leesburg, Virginia. The meeting, which was a joint effort of the USGS and the Geological Survey of Canada, featured several papers describing government resource studies in the United States and Canada that have indicated some favorable areas for mineral exploration. The use of mineral-deposit models and new statistical methods of analyzing geophysical and geochemical data in resource assessment and exploration were also discussed at the workshop. About 120 representatives of government agencies, mining firms, and universities in Canada and the United States participated in the plenary sessions and discussion groups. The results are to be published as a USGS Circular.

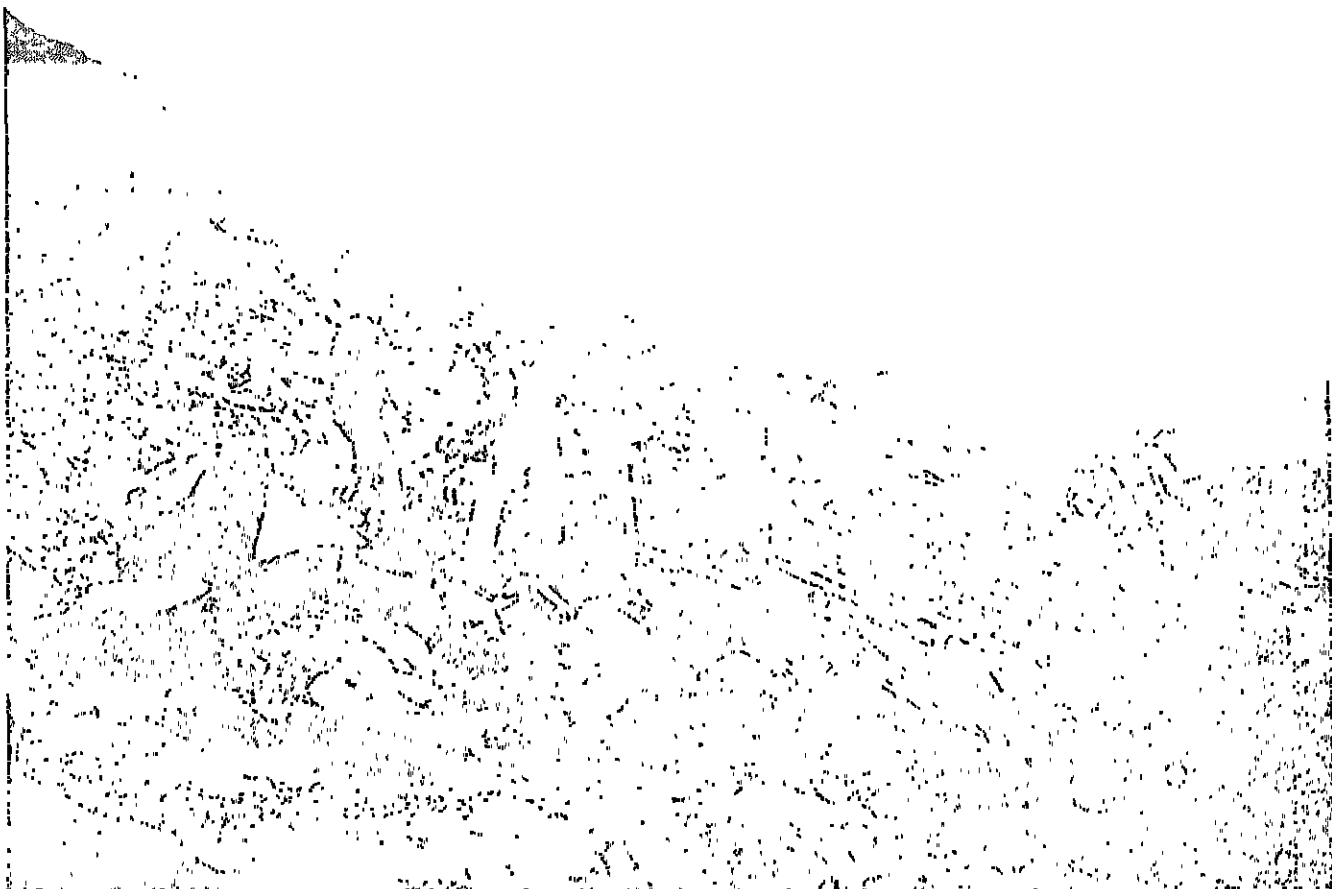
A number of commodity specialists from the U.S. Bureau of Mines attended meetings worldwide which addressed developments in the supply of strategic materials. The rare-earths specialist attended the International Conference on Rare-Earth Development and Applications in Beijing, China, and inspected rare-earth mining operations in the Inner Mongolia Autonomous Region. The tungsten specialist participated in the International Tungsten Symposium in Madrid, Spain, and visited Spanish tungsten mining operations. The aluminum specialist spent three months in Geneva, Switzerland, on an assignment with the General Agreement on Trade and Tariffs staff to assist in the preparation of a report on international trade in bauxite, alumina, and aluminum. The Bureau's Assistant Director for Minerals Information chaired a meeting on statistics for the International Lead and Zinc Study Group in London, England, and the Chief of the Far East and Australia Branch inspected mineral production in the Philippines (see photo).



In June 1985, Thomas M. Nasiatka, U.S. Bureau of Mines, inspected the 60,000 ton-per-year ferro chromium plant at Tagoloan, Mindanao, Philippines, to insure that Bureau information is fully up-to-date.

In 1982 the Bureau of Mines published Information Circular 8897 titled "Platinum Availability—Market Economy Countries." The Bureau estimated that 15 known major deposits contain demonstrated resources totaling over 300 million troy ounces of platinum. One of the U.S. Deposits included in this study was the Goodnews Bay Mine located along the Salmon River near the Bering Sea in western Alaska. This mine produced 641,000 troy ounces from 1934 to 1975 and it was estimated in the study that the deposit could yield an additional 500,000 troy ounces at a rate of 10,000 ounces per year, equivalent to about one percent of domestic needs. The Bureau of Mines is conducting platinum resource studies that include possi-

ble marine placers at Goodnews Bay. In the summer of 1985, sampling included the following: auger drilling (see photo) and test pitting along beaches; bottom samples obtained by diving to depths of 20-to-30 feet at distances of up to 1.5 miles from shore; and bottom samples obtained with a sampler device operated from the research vessel "K-Way." Two bulk samples were shipped to the Albany Research Center, Albany, Oregon, for chemical analysis and possible metallurgical testing. All other samples have been retained at Fairbanks, Alaska, for petrographic and mineralogic studies to determine characteristics of the platinum and associated chromite and other metal values.



Auger drilling a magnetic anomaly on Walrus Beach where platinum was found in black sand concentrations.

Offshore data, principally bathymetric surveys, also were obtained aboard the "K-Way" by Bureau personnel working with the University of Alaska's Institute of Marine Science (IMS) personnel (see photo). The IMS is cooperating with the French government on arctic research in the Bering and Chukchi seas but the Bureau of Mines-supported Goodnews Bay maritime project is the only one that is minerals-oriented.



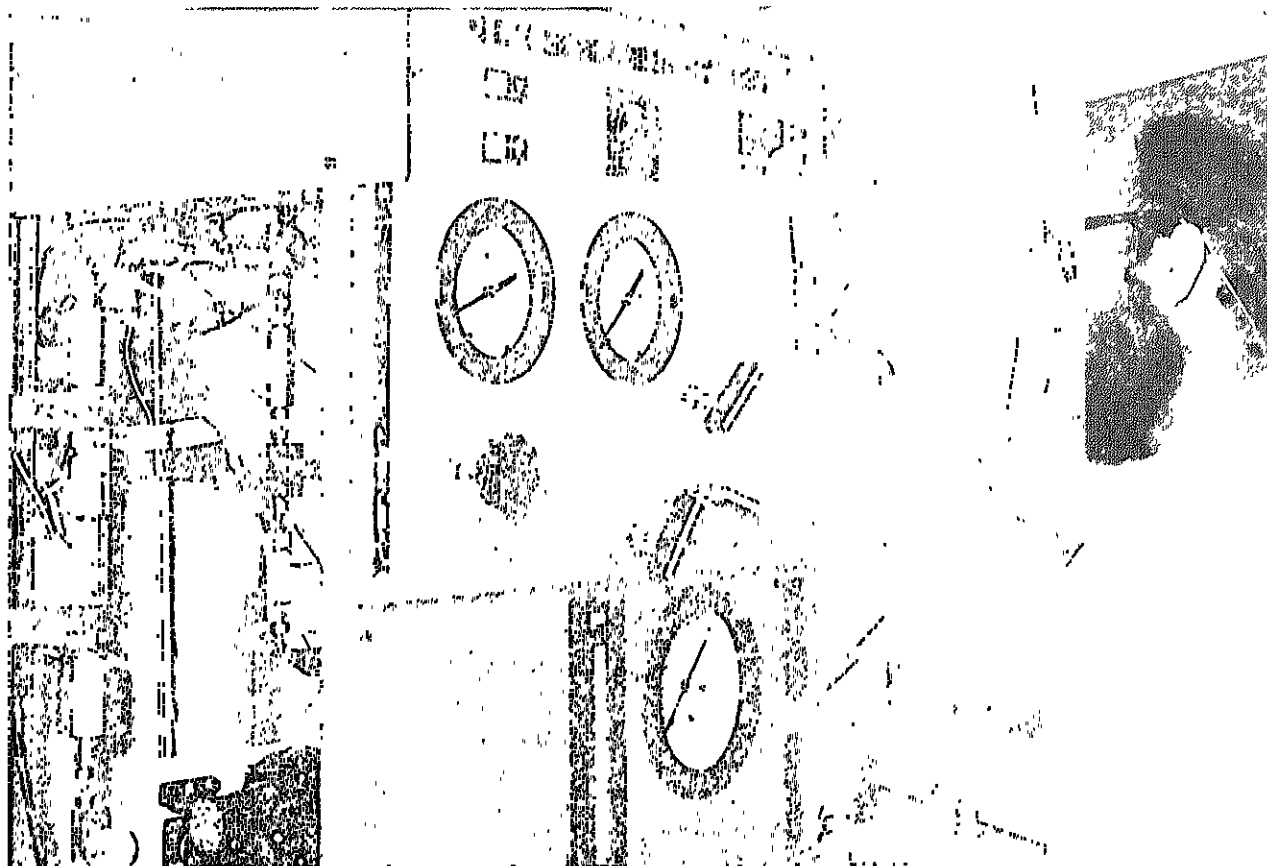
After recovery operations aboard the "K-Way" by the Bureau of Mines and IMS personnel.

Reports and Publications: The Bureau of Mines has prepared the 1985 edition of "Mineral Facts and Problems." This broad review of the mineral sector of the world economy includes up-to-date information on resources, reserves, productive capacity, production, uses, international trade, major fields of use, current and anticipated technology, corporate structure, and outlook to the year 2000. All 78 chapters, each covering a single mineral—most of which are strategic and critical—are available as preprints.

The Bureau of Mines prepared its annual reviews of the Mineral Industries of China and of the U.S.S.R. These reviews include production and trade data for individual mineral commodities through 1984, as well as summaries of important mineral developments, and were carried in the "Mining Annual Review 1985" published by the Mining Journal, Ltd., London, England.

Minerals Technology: Leaching and solvent ex-

traction are chemical separation methods that have been used for many years by the mining industry for metal recovery. Bureau of Mines scientists have found that certain leach solutions and solvent extractants have unique properties when heated to a temperature (the critical temperature) above which they cannot become a liquid regardless of the pressure applied. However, through the application of pressure, the supercritical fluids may be made as dense as a liquid. A portion of the apparatus used is shown (see photo). This method of extraction makes the dissolving power of the fluid continuously variable. Thus, extraction and leaching properties can be continuously varied by pressure changes. The Bureau is evaluating the application of this new technology to the recovery of cobalt, chromium, manganese, and other strategic metals. If successful, this technology could reduce to a single operation the separation of strategic metals occurring in complex domestic ores (current technology requires several stages for completion of this task).



Supercritical fluids are being investigated by the Bureau of Mines for extracting minerals from complex ores.

The fine grinding required to liberate chromite, cobalt, manganese, and fluorite minerals from low-grade domestic ores produces mineral particles too fine to separate efficiently by conventional methods. Column flotation has proven to be more effective for fine particle separations than conventional flotation techniques and is presently being used commercially to recover byproduct molybdenum from copper ores. Pilot-scale column flotation cells are used by Bureau of Mines scientists to obtain engineering and economic data for the recovery of manganese from domestic ores.

Over 60 percent of the chromium used in the United States is for making stainless steels, which

generally contain about 18 percent chromium. The Bureau of Mines is conducting research on new alloys that do not require as much chromium. Two of these alloys have been identified with properties similar to stainless steel. Both are iron-base alloys. One contains nine percent chromium along with nickel, molybdenum, and vanadium and has good low-temperature corrosion resistance. The other contains eight percent chromium with nickel, silicon, and aluminum and shows good high-temperature oxidation resistance. Mechanical properties such as tensile strength and ductility must be determined (see photo) before these alloys can be used in engineering applications where stainless steels are now used.



A Bureau of Mines science technician prepares a new low chromium alloy specimen for testing at high temperatures.

Materials Substitution: The Critical Agricultural Materials Act, Public Law 98-284, passed on May 16, 1984, established the Office of Critical Agricultural Materials, and identified the U.S. Department of Agriculture (USDA) as lead agency in the research and development of native latex from guayule and other critical agricultural materials. The Act also expanded the Joint Commission on Research and Development of Critical Agricultural Materials to three representatives each from the Departments of Agriculture and Commerce, and one member each from the National Science Foundation, the Departments of State and Defense, and the Federal Emergency Management Agency.

The Act identified a new role for USDA by recognizing the role the Agency could play in providing materials to support the Nation's industrial base.

The joint efforts of USDA, the U.S. Army Automotive Tank Command of Warren, Michigan, and Texas A&M University (especially the State Experiment Station and the Food Protein Research Laboratory) have developed a process for extraction of natural rubber from the guayule plant. The Texas facility which has been operating for about 12 months is to produce one ton of rubber for the Automotive Tank Command for testing as tank pads and on other land-based vehicles. After delivery of the rubber to the U.S. Army Automotive Tank Command, the pilot plant will continue to operate for research purposes and for providing test quantities of rubber to various research organizations and industry. Plant-breeding and genetics research have identified some new and promising selections capable of producing significantly more rubber than current USDA varieties.

The USDA is promoting a search for domestically-produced substitutes from among a variety of agricultural plants, which can alleviate the high degree of U.S. reliance on foreign suppliers. For example, lesquerella, a hydroxy acid crop, grown in central and south central U.S. is a potential replacement for imported castor oil.

PROPERTY MANAGEMENT

Section 6 of the Strategic and Critical Materials Stock Piling Act grants authority to the President to conduct the property management functions of the National Defense Stockpile. Executive Order 12155 delegates this property management authority to the Administrator of General Services under the policy guidance of FEMA as provided in Section 3 of the Act. The Federal Property Resources Service (FPRS) of GSA is assigned the disposal, rotation, acquisition, market analysis, quality assurance, receiving, storage, maintenance, security, environmental control, and shipping activities of the Stockpile program.

Inventory Quality Assessment

The quality of certain commodities must be assessed when there is deterioration, an incomplete evaluation, or if the quality against current specifications is unknown (i.e., specifications that contain significant changes due to technological advances since the materials were first acquired). During this period, results from the sampling and analysis of platinum, palladium, and iridium were evaluated. Other commodities assessed included iodine, quinine sulfate, quinidine sulfate, titanium, high carbon ferromanganese, technically specified rubber, and cobalt.

Stockpile Operations

Forty new stockpile operations projects were initiated during the reporting period to protect the integrity of stockpile commodities. Approximately \$3.06 million of program operating funds were obligated to complete these projects. These activities are part of a continuous effort to protect the quality of stockpile materials, to enhance the stockpile readiness posture, and to improve the health and safety conditions of stockpile locations.

Deliveries

Bauxite, refractory: Approximately 51,000 tons of refractory grade bauxite from the People's Republic of China were accepted by the Govern-

ment at its Granite City, Illinois, depot. The accepted material was valued at \$1.9 million and completes the contracts with Cometals, totaling \$11.1 million for 75,000 tons.

Beryllium: Nine billets of beryllium, hot-pressed powder block, were accepted by the Government and placed in storage in Hammond, Indiana. This \$13.5 million contract with Brush-Wellman in Elmore, Ohio, is for 24 billets weighing 60,000 pounds.

Cobalt: Memaco of Zambia supplied 340,696 pounds of cobalt worth \$1.8 million. The material was accepted at the Binghamton, New York, depot. The final 340,000 pounds, out of a total contract with the International Nickel Company of Canada (INCO) for 500,000 pounds of cobalt electrolytic rounds (total contract value, \$5.8 million), was delivered to Binghamton, New York. Electrolytic rounds are a new form of cobalt for the Stockpile.

Iridium and Palladium: Iridium and palladium were delivered to secure vaults at Fort Knox, Kentucky. Engelhard Corporation of Iselin, New Jersey, delivered 600 troy ounces of iridium valued at approximately \$250,000. Amax Copper and Philipp Brothers, Inc., of New York City, delivered 8,400 troy ounces of palladium valued at \$1.1 million.

Jewel Bearings: The William Langer Jewel Bearing Plant, a Government-owned facility at Rolla, North Dakota, delivered 366,646 jewel bearings to the Stockpile.

Nickel: International Nickel Company and Falconbridge of Norway delivered 3,800 tons of special high-purity nickel to the New Haven, Indiana, and Binghamton, New York, depots. The material, valued at \$18.3 million, was inspected and accepted at the depot.

Quinidine: The final 129,860 ounces of quinidine sulfate, a powdered medicinal, were supplied under contract by R. W. Greef and Company, Inc., of Old Greenwich, Connecticut. The material, produced in the Netherlands and delivered to Hammond, Indiana, has a value of \$5.3 million.

Rubber: Approximately 6,500 long tons of ribbed smoked sheet rubber has been delivered under a Basic Ordering Agreement (BOA). Of the total received, 4,537 long tons valued at \$4.6 million were accepted and stockpiled at the Binghamton and Scotia depots in New York during the period.

Titanium: The final 386 tons of titanium sponge were delivered by Timet of Pittsburgh, Pennsylvania, and accepted at Stockton, California.

Vanadium: The total UMETCO contract quantity of 282,345 pounds of vanadium pentoxide was accepted at Somerville, New Jersey. The contract value was \$843,000.

FERROALLOY UPGRADING PROGRAM

In accordance with President Reagan's directive of November 1982, GSA continues to upgrade chromite and manganese ores to high-carbon ferrochromium and high-carbon ferromanganese. The project was initiated to help sustain a U.S. ferroalloy furnace and processing capability vital to national security, and to reduce the need for conversion of raw materials into ferroalloys in time of an emergency.

Calendar year 1985 contracts are with Macalloy Corporation of Charleston, South Carolina, and Elkem Metals Company of Pittsburgh, Pennsylvania, for the upgrading of chromite and manganese ores, respectively. The total direct cost of the two contracts is estimated to be \$42 million. Payments to the contractors are made using excess stockpile materials currently authorized for disposal.

Calendar year 1985 contracts call for outloading, sampling, and upgrading approximately 137,000 short tons of chromite and 88,000 short tons of manganese ore (to be shipped to the contractors), and for sampling, testing, and stockpiling the approximately 50,000 short tons of ferrochromium and 47,000 short tons of ferromanganese (to be received in return). Both contracts are expected to be completed during December of 1985.

Under the upgrading program during calendar year 1985, approximately 262,643 short tons of chromite ore and 136,289 short tons of manganese ore were shipped out for upgrading during the report period. Approximately 98,516 short tons of ferrochromium and 66,176 short tons of ferromanganese have been received in return. The amounts received will not be reflected in inventory totals appearing in Table 2 (of this report) until weighted averages are calculated and analyses finalized.

Options on both contracts have been exercised for calendar year 1986. This will result in a third year of operations. Under these options approximately 58,557 short tons of manganese ore and approximately 92,184 tons of chromite ore are to be shipped to the contractors for conversion into ferromanganese and ferrochromium. The total direct cost of the two options is estimated to be \$35 million.

STATUS OF THE NATIONAL DEFENSE STOCKPILE INVENTORY

In Figure 7, the composition of the stockpile inventory, as of September 30, 1985, is compared with the goals for stockpile materials. To fill the goals at September 30, 1985, prices would require acquisition of additional materials valued at approximately \$9.7 billion. The inventory of the stockpile contains \$6.9 billion of materials toward a total goal value of \$16.6 billion. The total stockpile inventory, as of September 30, 1985, is valued at \$10.0 billion, including an excess inventory not held for goals valued at \$3.1 billion.

Figure 8 presents details by family group for the values listed in Figure 7. This figure shows goal values, in ascending order, of each group of materials. Applied against these values are the shortfalls or excesses in inventory, as appropriate. The numbers next to each material name indicate

the corresponding numbers used in the Table 2 listing (see Appendix 1).

Offsets have been applied to provide a more accurate picture of progress toward goals. The term "offset" means the allocation of an equivalent amount of one form of a material as a credit toward the goal for another form. (See Appendix 2, Procedure, for an example of how offsets are computed.)

Rank orderings by value, as of September 30, 1985, of the family groups of stockpile materials for which there is inventory excess to stockpile goals or for which there is a shortfall in inventory to meet the goals are presented in Figures 8 and 9, respectively.

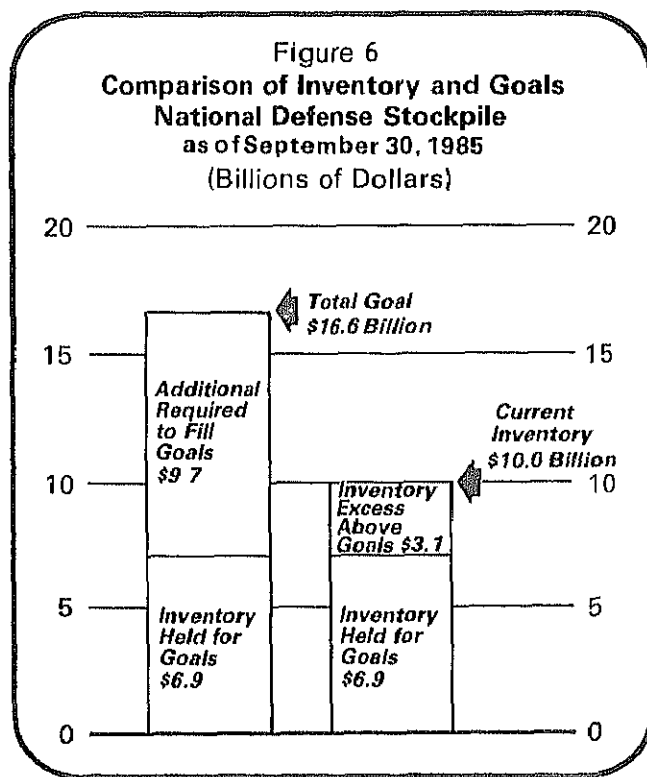
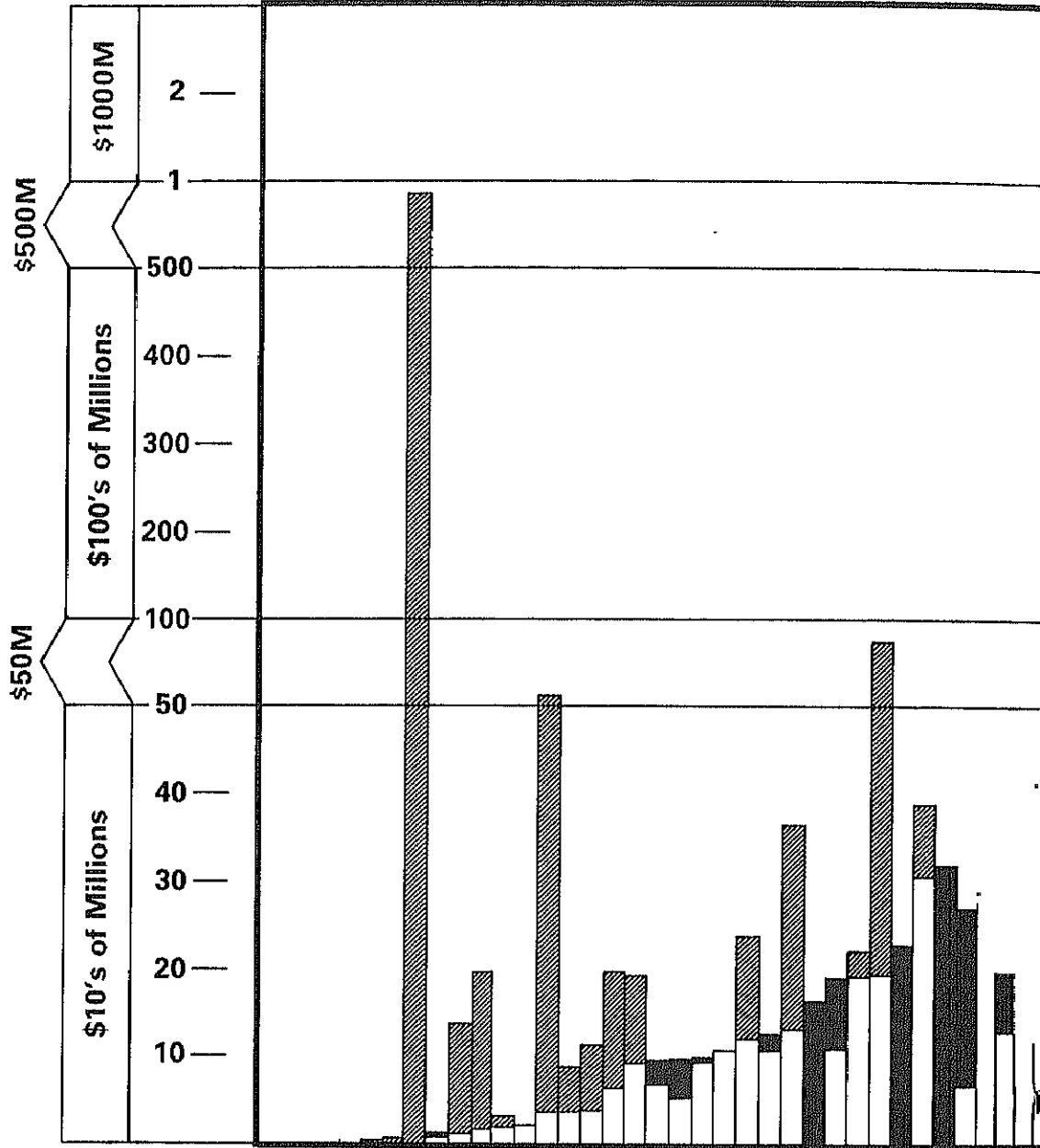


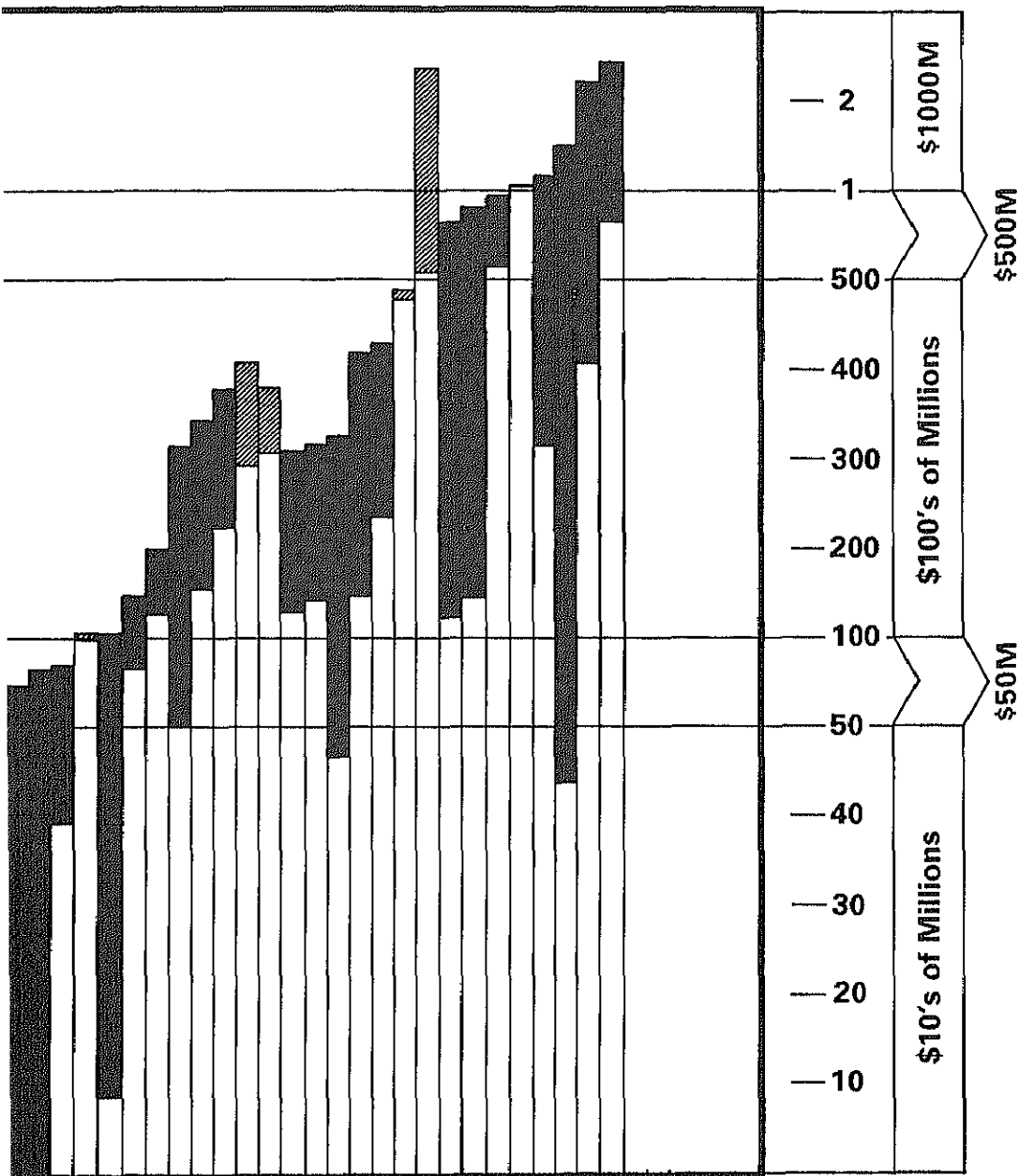
Fig
Status of the National Defense Stock
 (Arranged by Asc
 as of Septe



Unfilled Goals

- 35 Molybdenum Group
- 49 Sapphire and Ruby
- 52 Talc, Steatite-BI. & Lump
- 51 Silver, Fine
- 33 Mica, PB
- 31 Mica, MF, 1st & 2nd Qual.
- 54 Thorium Nitrate
- 34 Mica, PS
- 23 Graphite, Nat.-other
- 29 Mercury
- 59 Vegetable Tannin-Ch.
- 43 Quartz Crystals
- 5 Asbestos, Chrysotile
- 27 Manganese Dioxide-Bat.Gr
- 45 Quinine
- 9 Cadmium
- 8 Bismuth
- 61 Vegetable Tannin-Wa.
- 4 Asbestos, Amosite
- 21 Graphite, Natural Ceylon-Al.
- 50 Silicon Carbide-Cr.
- 37 Natural Insulation Fibers
- 46 Ricinoleic/Sebacic Acid Prod.
- 32 Mica, MS
- 60 Vegetable Tannin-Qu.
- 16 Cordage Fibers, Sisal
- 24 Iodine
- 20 Germanium
- 44 Quinidine
- 30 Mica, MB-Stained & Better
- 48 Rutile
- 13 Platinum Group Metal L

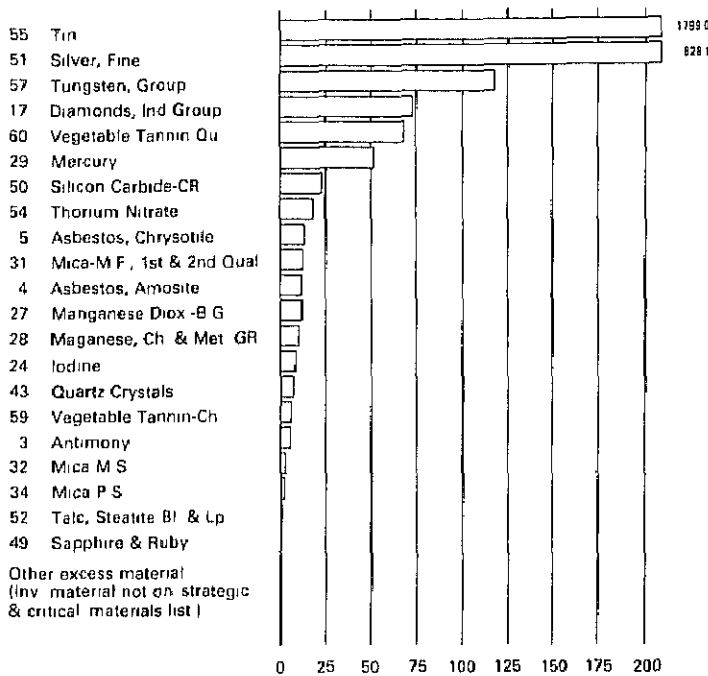
Inventory Material Family Groups (Targeting Goal Value) as of 30, 1985



NOTE: VARIABLE
SCALING USED ON
THIS GRAPH

Other NDS Excess Materials*

Figure 8.
Excesses in Inventory
of Stockpile Materials
as of September 30, 1985
(\$ Millions)



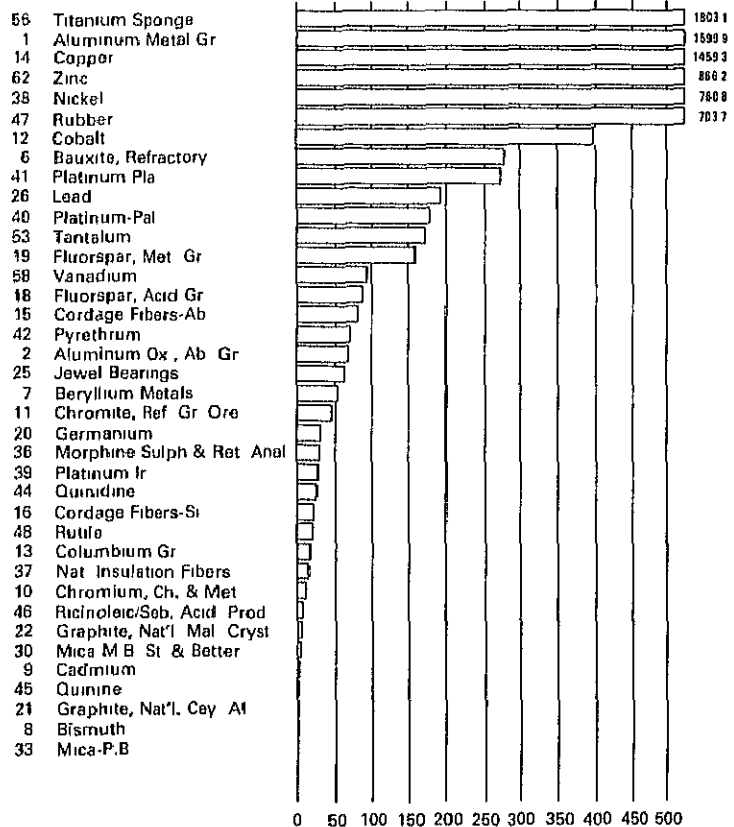
STOCKPILE INVENTORY EXCESSES AFTER APPLYING OFFSETS.

TOTAL EXCESS: \$3.1 BILLION

STOCKPILE INVENTORY SHORTFALLS AFTER APPLYING OFFSETS.

TOTAL SHORTFALL: \$ 9.7 BILLION

Figure 9.
Shortfalls in Inventory
of Stockpile Materials
as of September 30, 1985
(\$ Millions)



PURCHASE SPECIFICATIONS

Purchase specifications are developed by the Interagency Committee for Stockpile Purchase Specifications. This Committee is chaired by the Department of Commerce with members representing the Departments of Defense, the Interior, Agriculture, and State, and GSA and FEMA. The draft specifications are approved by FEMA and published by the Department of Commerce.

During this report period the Interagency Committee for Stockpile Purchase Specifications reviewed proposed specifications and provided technical support in revising specifications for aluminum oxide (crude fused), refractory chromite, platinum, and vanadium pentoxide.

Since 1976, the Committee has developed and reviewed Stockpile Purchase Specifications for 59 materials. (See Figure 10.)

Figure 10
NATIONAL DEFENSE STOCKPILE PURCHASE SPECIFICATIONS

Number	Material	Date issued
P 62 R3	Aluminum	August 31, 1984
P 90 R3	Aluminum Oxide Abrasive, Fused, Crude	November 13, 1980
P 2a R4	Antimony Metal	June 10, 1980
P 2b R2	Antimony Sulphide Ore and Concentrates— Chemical Grade	June 10, 1980
P 3 R6	Asbestos—Chrysotile	February 26, 1982
P 90a	Bauxite—Abrasive Grade	June 22, 1981
P 5b R1	Bauxite, Metal Grade, Jamaica Type	February 9, 1983
P 5c R5	Bauxite, Refractory Grade	June 22, 1982
P 6 R5	Beryl Concentrates	November 13, 1980
P 94 R3	Beryllium—Copper Master Alloy	November 13, 1980
P 110a R1	Beryllium Metal, Hot Pressed Powder Billets	May 9, 1984
P 110 R2	Beryllium Metal, Vacuum Cast Ingot	June 25, 1981
P 7 R4	Bismuth	June 10, 1980
P 8 R2	Cadmium	March 7, 1979
P 9 R3	Castor Oil	June 22, 1982
P 88 R2	Chestnut Tannin Extract	February 1, 1980
P 65 R4	Chromite—Chemical Use	April 4, 1985
P 96 R3	Chromium Metal	May 23, 1985
P 11a R6	Ferrochromium—Low Carbon	June 9, 1976
P 11b R4	Ferrochromium—High Carbon	July 25, 1983
P 13 R5	Cobalt	June 28, 1983
P 113 R2	Columbium Source Materials	January 27, 1984
P 16a R3	Copper	March 16, 1984
P 17b R6	Cordage Fibers—Sisal	October 19, 1977
P 18 R2	Corundum—Massive Micro Crystalline Ore	January 23, 1977
P 69a R2	Fluorspar—Acid Grade	January 2, 1976
P 69b R3	Fluorspar—Metallurgical Grade	May 10, 1984
P 40 R	Iridium	June 25, 1981
P 25 R2	Jewel Bearings	March 27, 1981
P 28 R3	Lead	March 16, 1984
P 98 R3	Manganese Metal—Electrolytic	June 9, 1976
P 30a R4	Ferromanganese (Standard High Carbon)	July 25, 1983
P 37a R	Morphine Sulphate	March 7, 1979
P 36 R4	Nickel—High Purity	January 26, 1983
P 37 R3	Opium	March 7, 1979
P 99 R6	Palladium	June 25, 1981
P 41 R5	Platinum	June 25, 1981
P 42 R2	Pyrethrum Extract	February 1, 1980
P 44 R3	Quebracho Tannin Extract	February 1, 1980
P 45 R4	Quinidine Sulfate	January 26, 1983
P 46 R3	Quinine Sulfate	November 13, 1980
P 48a R5	Rubber—Crude Natural	October 19, 1977
P 48b R	Rubber—Technically Specified Rubber (Hevea)	June 2, 1982
P 48c R	Rubber—Parthenium (Guayule)	August 27, 1984
P 49 R6	Rutile	November 3, 1981
P 25a	Sapphire and Ruby Components, Synthetic	March 27, 1981
P 95 R2	Silicon Carbide—Crude	January 12, 1981
P 112 R2	Silver	June 10, 1980
P 53 R2	Talc (Steatite) Block	June 10, 1980
P 53a R2	Talc (Steatite) Lump	June 10, 1980
P 106 R3	Tantalum Carbide Powder	February 1, 1980
P 113a	Tantalum Source Materials	August 3, 1981
P 55 R3	Tin	June 10, 1980
P 97 R7	Titanium Metal Sponge	June 2, 1982
P 58 R2	Vanadium Pentoxide	June 25, 1981
P 100 R1	Ferrovandium	October 19, 1977
P 87 R2	Wattle Tannin Extract	February 1, 1980
P 59 R1	Zinc	March 16, 1984

APPENDIX 1

NATIONAL DEFENSE STOCKPILE INVENTORY

The data on the National Defense Stockpile inventory given in Table 2 excludes quantities that were sold but not shipped from depots to the purchasers. In the Statistical Supplement (available from the General Services Administration), the inventory is listed as "Total Inventory in Storage" with a separate line for "Unshipped Sales."

The inventory quantities given in Table 2 combine stockpile and nonstockpile grade materials. Separate quantities for each of these grades can be found in the Statistical Supplement. Nonstockpile grade material may vary only slightly from the stockpile grade and in some cases is temporarily credited toward goals.

For some materials where a goal deficit occurs, the excess of another form of the material is held to offset the shortage as indicated in the footnotes at the end of Table 2. The term "offset" means the allocation of an equivalent amount of one form of a material as a credit toward the goal for another form.

Materials are grouped by "families," and a summary line for each basic family group is included. The materials have been grouped in each family according to their status as raw materials, semifinished products, or finished products that contain the same common ingredient. The values shown in the summary line for each family group are expressed in the basic unit common to all members of the group. In all but three cases, this basic unit is the metal equivalent for each form. There is a different conversion factor for each form because each requires different technology and incurs different losses for conversion. The factors used for calculating these equivalent amounts and the calculation procedure are provided in Appendix 2.

Market values are current prices at which comparable materials are being traded. In the absence of current trading, the values are estimates. They are not necessarily the amount that would be realized if the material were sold. A key to abbreviations used in Table 2 and elsewhere in this report is provided in Table 1.

Abbreviations

AMA LB	- Anhydrous Morphine Alkaloid (Pounds)
Av Oz	- Avoirdupois Ounce
FL	- Flask (76-Pound)
KT	- Carat
LB	- Pound
LB Cb	- Pounds of Contained Columbium
LB Co	- Pounds of Contained Cobalt
LB Mo	- Pounds of Contained Molybdenum
LB Ta	- Pounds of Contained Tantalum
LB W	- Pounds of Contained Tungsten
LCT	- Long Calcined Ton

LDT	- Long Dry Ton
LT	- Long Ton
MT	- Metric Ton
PC	- Piece
SDT	- Short Dry Ton
ST	- Short Ton
ST Ni+Co	- Short Tons of Contained Nickel Plus Cobalt
ST V	- Short Tons of Contained Vanadium
Tr Oz	- Troy Ounces

Table 2

NATIONAL DEFENSE STOCKPILE INVENTORY OF STRATEGIC AND CRITICAL MATERIALS

September 30, 1985

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Offset Excess
1. Aluminum Metal Group	SI Al Metal	7,150,000	4,278,912	\$ 827.9	2,871,090
Alumina	SI	0	0	-	-
Aluminum	SI	700,000	2,080	3.4	697,920
Bauxite, Metal Grade, Jamaica Type	LDT	21,000,000	12,457,740	560.6	8,542,260
Bauxite, Metal Grade, Surinam Type	LDT	6,100,000	5,299,597	263.9	800,403
2. Aluminum Oxide, Abrasive Grain Group	SI Ab Grain	638,000	259,124	128.6	378,876
Aluminum Oxide, Abrasive Grain	SI	0	50,904	63.6	b
Aluminum Oxide, Fused, Crude	SI	0	249,867	65.0	b
Bauxite, Abrasive Grade	LCI	1,000,000	0	-	b
3. Antimony	SI	36,000	37,643	104.1	1,843
4. Asbestos, Amosite	SI	17,000	34,011	23.8	17,011
5. Asbestos, Chrysotile	SI	3,000	10,705	19.5	7,705
6. Bauxite, Refractory	LCI	1,400,000	199,926	46.6	1,200,074
7. Beryllium Metal Group	SI Be Metal	1,220	1,079	223.0	141
Beryl Ore (11% BeO)	SI	18,000	17,987	20.0	13
Beryllium Copper Master Alloy	SI	7,500	7,387	94.4	513
Beryllium Metal	SI	400	280	106.6	120
8. Bismuth	LB	2,200,000	2,081,298	9.2	118,702
9. Cadmium	LB	11,700,000	6,328,809	5.2	5,371,191
10. Chromium, Chemical and Metallurgical Group	SI Cr Metal	1,353,000	1,268,449	1,043.2	c
Chromite, Chemical Grade Ore	SDI	675,000	242,414	11.9	c
Chromite, Metallurgical Grade Ore	SDI	3,200,000	2,290,459	232.8	c
Chromium, Ferro, High Carbon	SI	185,000	402,696	300.1	c
Chromium, Ferro, Low Carbon	SI	75,000	318,942	418.1	c
Chromium, Ferro, Silicon	SI	90,000	58,357	52.1	c
Chromium, Metal	SI	20,000	3,763	28.2	c
11. Chromite, Refractory Grade Ore	SDI	850,000	391,414	39.1	458,586

Table 2 (continued)

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Offset Excess	Quantity After Crediting Offset Deficit
12. Cobalt	LB Co	85,400,000	50,191,130	\$ 567.2		35,208,870
13. Columbium Group	LB Cb Metal	4,850,000	2,713,469	19.6		2,136,531
Columbium Carbide Powder	LB Cb	100,000	21,372	.6		78,628
Columbium Concentrates	LB Cb	5,800,000	2,019,218	12.3		d
Columbium, Ferro	LB Cb	0	930,911	5.3		d
Columbium, Metal	LB Cb	0	44,951	1.6		d
14. Copper	SI	1,000,000	29,048	43.7		970,952
15. Cordage Fibers, Abaca	LB	155,000,000	0	-		155,000,000
16. Cordage Fibers, Sisal	LB	60,000,000	0	-		60,000,000
17. Diamond, Industrial Group	KT	29,700,000	34,825,130	379.7	5,125,130	
Diamond Dies, Small	PC	60,000	25,473	1.1		34,527
Diamond, Industrial, Crushing Bort	KT	22,000,000	22,001,344	38.5	1,344	
Diamond, Industrial, Stones	KT	7,700,000	12,911,050	340.1	5,111,050	
18. Fluorspar, Acid Grade	SDI	1,400,000	895,983	155.0		504,017
19. Fluorspar, Metallurgical Grade	SDI	1,700,000	411,739	51.5		1,288,262
20. Germanium	XG	30,000	0	-		30,000
21. Graphite, Natural, Ceylon, Amorphous Lump	SI	6,300	5,500	10.7		800
22. Graphite, Natural, Malagasy, Crystalline	SI	20,000	17,838	53.5		2,162
23. Graphite, Natural, Other Than Ceylon & Malagasy	SI	2,800	2,903	2.0	3	
24. Iodine	LB	5,800,000	7,372,112	38.5	1,572,112	
25. Jewel Bearings	PC	120,000,000	73,234,255	82.4		46,765,745
26. Lead	ST	1,100,000	501,025	234.4		498,975
27. Manganese, Dioxide, Battery Grade Group	SDI	87,000	208,165	19.2	121,165	
Manganese, Battery Grade, Natural Ore	SDI	62,000	205,154	15.0	e	
Manganese, Battery Grade, Synthetic Dioxide	SDI	25,000	3,011	4.2		e

Table 2 (continued)

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Excess	Offset Deficit
28. Manganese, Chemical & Metallurgical Group	SI Mn Metal	1,500,000	1,911,396	\$ 489.7	377,794	
Manganese Ore, Chemical Grade	SDI	170,000	171,806	14.1	1,805	f
Manganese Ore, Metallurgical Grade	SDI	2,700,000	3,222,087	149.0		
Manganese, Ferro, High Carbon	SI	439,000	524,310	273.1		
Manganese, Ferro, Low Carbon	SI	0	0	-		
Manganese, Ferro, Medium Carbon	SI	0	29,057	19.7		
Manganese, Ferro, Silicon	SI	0	23,574	11.1		
Manganese Metal, Electrolytic	SI	0	14,172	22.7		
29. Mercury	FL	10,500	170,539	55.4	160,039	
30. Mica, Muscovite Block, Stained & Better	LB	6,200,000	5,212,361	27.8		987,539
31. Mica, Muscovite Film, 1st & 2nd Qualities	LB	90,000	1,177,032	13.8	1,087,032	
32. Mica, Muscovite Splittings	LB	12,630,000	14,652,181	22.0	2,022,181	
33. Mica, Phlogopite Block	LB	210,000	130,745	.7		79,255
34. Mica, Phlogopite Splittings	LB	930,000	1,518,951	3.0	588,951	
35. Molybdenum Group	LB Mo	0	0	-	-	
Molybdenum Disulphide	LB Mo	0	0	-	-	
Molybdenum, Ferro	LB Mo	0	0	-	-	
36. Morphine Sulphate and Related Analgesics	AMA LB	130,000	71,303	26.6		58,697
Crude	AMA LB	0	31,795	5.3		
Refined	AMA LB	130,000	39,508	21.3		
37. Natural Insulation Fibers	LB	1,500,000	0	-		1,500,000
38. Nickel	SI Ni+Co	200,000	32,209	145.0		167,791
39. Platinum Group Metals, Iridium	Ir Oz	98,000	27,790	11.8		70,210
40. Platinum Group Metals, Palladium	Ir Oz	3,000,000	1,255,001	129.6		1,744,999
41. Platinum Group Metals, Platinum	Ir Oz	1,310,000	452,641	144.9		857,359
42. Pyrethrum	LB	500,000	0	-		500,000
43. Quartz Crystals	LB	600,000	1,848,532	11.1	1,248,532	
44. Quinidine	Av Dz	10,100,000	2,008,979	6.6		8,091,121

Table 2 (continued)

Material	Unit	Goal	Inventory	Value of Inventory (Millions \$)	Quantity After Crediting Excess	Offset Deficit
45. Quinine	Av Oz	4,500,000	3,246,154	\$ 6.6		1,253,836
46. Ricinoleic/Sebacic Acid Products	LB	22,000,000	12,524,242	10.7		h
47. Rubber	MT	864,000	127,160	121.5		736,840
48. Rutile	SDI	106,000	39,186	12.9		66,814
49. Sapphire and Ruby	KT	0	16,305,502	.2	16,305,502	
50. Silicon Carbide, Crude	ST	29,000	80,550	36.2	51,550	
51. Silver, Fine	Tr Oz	0	136,005,707	928.1	136,005,707	
52. Talc, Steatite Block & Lump	ST	28	1,061	.4	1,053	
53. Tantalum Group	LB 1a Metal	7,150,000	2,642,073	142.5		4,517,927
Tantalum, Carbide Powder	LB 1a	0	26,698	4.7	1	
Tantalum Metal	LB 1a	0	201,133	44.2	1	
Tantalum Minerals	LB 1a	8,400,000	2,837,943	93.6		i
54. Thorium Nitrate	LB	600,000	7,121,812	19.6	6,521,812	
55. Tin	MT	42,700	165,434	2,336.8	142,734	
56. Titanium Sponge	ST	195,000	36,831	404.7		158,169
57. Tungsten Group	LB W Metal	50,665,000	74,707,435	409.1	24,041,435	
Tungsten Carbide Powder	LB W	2,000,000	2,032,942	23.2	J	
Tungsten, Ferro	LB W	0	2,025,361	24.8	J	
Tungsten, Metal Powder	LB W	1,600,000	1,998,831	24.5	J	
Tungsten Dross & Concentrates	LB W	55,450,000	80,787,663	336.6	J	
58. Vanadium Group	ST U Metal	8,700	721	8.6		7,979
Vanadium, Ferro	ST U	1,000	0	-		1,000
Vanadium Pentoxide	ST U	7,700	721	8.6		6,979
59. Vegetable Tannin Extract, Chestnut	LI	5,000	12,734	8.6	7,734	
60. Vegetable Tannin Extract, Quebracho	LI	28,000	126,781	87.1	98,781	
61. Vegetable Tannin Extract, Wattle	LI	15,000	15,001	10.6	1	
62. Zinc	ST	1,425,000	378,316	313.1		1,046,684

Table 2 (continued)

Footnotes

- a. Bauxite, Metal Grade, Jamaica Type. Includes 400,000 LDI in the physical custody of BSA, title to which is scheduled to be transferred to the Stockpile during Fiscal Years 1988-1990.
- b. Aluminum Oxide, Fused Crude. Hold 50,904 SI of aluminum oxide, abrasive grain, and 249,887 SI of aluminum oxide, fused crude, as offset against 378,253 LCI of bauxite, abrasive grade
- c. Chromium Group, Chemical and Metallurgical Grades. Metallurgical grade ore goal is 3,200,000 SDI of specification grade, inventory 1,948,683 SDI; shortfall 1,251,317 SDI.
- (1) Hold 217,596 SI of Fe Cr, high carbon, against shortfall of 544,240 SDI of specification grade ore.
 - (2) Hold 243,892 SI of Fe Cr, low carbon, against 609,730 SDI of specification grade ore.
 - (3) Hold 97,347 SDI of nonspecification grade metallurgical ore against the balance of the 97,347 SDI specification grade ore shortfall.
 - (4) Hold 47,455 SDI of nonspecification grade metallurgical ore against a shortfall of 31,543 SI of Fe Cr Si.
 - (5) Hold 56,830 SDI of nonspecification grade metallurgical ore against a shortfall of 16,237 SI of chromium metal.
 - (6) Hold 165,854 SDI of nonspecification grade metallurgical ore against 165,854 SDI of chemical grade ore shortfall.
- d. Columbium Group.
- (1) Hold 930,911 pounds Cb as Fe Cb against 1,095,189 pounds Cb as concentrates.
 - (2) Hold 44,851 lb Cb as Cb metal against 52,786 lb Cb as concentrates.
- e. Manganese, Dioxide, Battery Grade Group.
- Hold 21,989 SDI of manganese, battery grade, natural ore against a shortfall of 21,989 SDI of manganese, battery grade, synthetic dioxide.
- f. Manganese Group, Chemical and Metallurgical Grades: Metallurgical grade ore goal is 2,700,000 SDI, inventory 2,322,212 SDI, shortfall 377,788 SDI of stockpile grade ore.
- (1) Hold 14,172 SI of Mn metal against 35,430 SDI of metallurgical ore.
 - (2) Hold 23,574 SI of Fe Mn Si against 42,133 SDI of metallurgical ore.
 - (3) Hold 29,057 SI of Fe Mn medium carbon against 58,114 SDI of metallurgical ore.
 - (4) Hold 120,905 SI of Fe Mn high carbon against 241,811 SDI of metallurgical ore.
 - (5) Hold remaining 54,404 SI of Fe Mn high carbon against reduction of ore value in desired inventory mix.
- g. Morphine Sulphate and Related Analgesics: Hold 31,795 AMA lb of crude against 31,795 AMA lb of refined goal.
- h. Ricinoic/Sebacinic Acid Products: Sebacinic acid inventory is credited toward goal at the rate of 2.5 to 1.
- i. Tantalum Group.
- (1) Hold 201,133 lb Ta as Ta metal against 237,337 lb Ta as concentrates.
 - (2) Hold 28,588 lb Ta as Ta C against 33,852 lb Ta as concentrates.
- j. Tungsten Group.
- (1) WC powder goal is 2,000,000 lb W; stockpile grade inventory 1,921,167 lb W, shortfall 78,833 lb W. Hold 111,775 lb W as nonspecification grade WC to offset 78,243 lb W as WC specification grade (assume 70 percent recovery of usable W)
 - (2) W metal powder goal is 1,600,000 lb W; inventory stockpile grade 1,566,964 lb W, shortfall 33,036 lb W. Nonstockpile grade W metal powder inventory is 331,947 lb W. Assume 70% recovery as usable material, then 331,947 x .70 = 232,363 lb W. Hold 47,194 lb W as nonspecification grade powder to offset shortfall of 33,036 stockpile grade W powder.
 - (3) Hold balance of nonstockpile grade W powder 232,363 - 33,036 = 199,327 lb W as powder against 234,209 lb W as concentrate
 - (4) Hold 840,752 lbs W as Fe W stockpile grade against 987,884 lb W as concentrate. Hold 1,184,609 lb W nonstockpile grade Fe W at 70 percent recoverable against 974,341 lb W concentrate.

APPENDIX 2

CALCULATION PROCEDURE FOR FAMILY GROUPINGS OF MATERIALS

The following example is designed to help the reader perform and understand the conversions and calculations used in preparing summary lines for basic family groupings. The purpose in using basic units for each of the families or groups of materials is to place the content of the primary material into a common denominator for easier comparison.

In time of emergency, there would be a need for a mix of various forms of each metal element. The stockpile goal for a metal is a mix of products at various stages of upgrading. The goal is calculated by examining expected wartime requirements, availability, and domestic capacity to produce each of the upgraded forms.

There is a different factor for converting each of the forms into a common denominator, usually the basic metal equivalent. The conversion factors are different because process conversion losses vary. The calculations and conversions used for the aluminum oxide abrasive grain group are shown as an example.

The aluminum oxide abrasive grain group has a surplus of aluminum oxide abrasive grain and of aluminum oxide fused crude but has a deficit of bauxite abrasive grade. Both aluminum oxide abrasive grain and fused crude are used to offset the shortfall in the abrasive grade bauxite but in different proportions for each because of upgrading processing losses.

PROCEDURE

1. Both aluminum oxide abrasive grain and aluminum oxide fused crude are upgraded products of abrasive grain bauxite. In converting each of these materials from bauxite, a process loss was incurred. Therefore, to use them as offsets against the deficit in abrasive grade bauxite, conversion factors greater than 1.0 are used to convert them back to equivalent amounts of bauxite.
2. The available surplus of aluminum oxide abrasive grain is 50,904 ST. To calculate the abrasive grade bauxite equivalent in LCT, multiply by the conversion factor: 1.55999 times 50,904 equals 79,410 LCT of bauxite equivalent.
3. The available surplus aluminum oxide fused crude is 249,867 ST. To convert this into bauxite equivalent in LCT, multiply by the conversion factor: 1.200 times 249,867 equals 299,840 LCT bauxite equivalent.
4. Add the two bauxite equivalents to find the total offset; 79,410 plus 299,840 equals 379,250 LCT.
5. The bauxite abrasive grade goal is 1,000,000 LCT; therefore, subtract the offset of 379,250 LCT, leaving a deficit of 620,750 LCT.

Factors Used for Converting Materials Into Family Groups

Materials	Unit	Multiple Factor	Basic Family Unit
Alumina	ST	0.518	Metal Equivalent, Aluminum
Aluminum Oxide, Fused, Crude	ST	0.833	Aluminum Oxide, Abrasive Grain
Bauxite, Abrasive Grade	LCT	0.641	Aluminum Oxide, Abrasive Grain S.T.
Bauxite, Metal Grade, Jamaica Type . . .	ST	0.231	Metal Equivalent, Aluminum
Bauxite, Metal Grade, Surinam Type . . .	ST	0.264	Metal Equivalent, Aluminum
Beryl Ore (11% BeO)	ST	0.028	Metal Equivalent, Beryllium
Beryllium Copper Master Alloy (4% Be) .	ST	0.04	Metal Equivalent, Beryllium
Chromite, Chemical Grade Ore	ST	0.286	Metal Equivalent, Chromium
Chromite, Metallurgical Grade Ore	ST	0.286	Metal Equivalent, Chromium
Chromium, Ferro, High Carbon	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Low Carbon	ST	0.714	Metal Equivalent, Chromium
Chromium, Ferro, Silicon	ST	0.429	Metal Equivalent, Chromium
Columbium, Concentrates	LB	0.850	Metal Equivalent, Columbium
Diamond Dies, Small	PC	0.50	Carat
Manganese, Dioxide, Battery Grade . . .	SDT	1.000	Manganese, Dioxide, Battery Grade, Synthetic
Manganese, Chemical Grade	ST	0.400	Metal Equivalent, Manganese
Manganese, Metallurgical Grade	ST	0.400	Metal Equivalent, Manganese
Manganese, Ferro, High Carbon	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Medium Carbon	ST	0.800	Metal Equivalent, Manganese
Manganese, Ferro, Silicon	ST	0.720	Metal Equivalent, Manganese
Opium Gum	AMA LB	1.000	Opium Salts
Tantalum Minerals	LB	0.85	Metal Equivalent, Tantalum
Tungsten Ores and Concentrates	LB	0.851	Metal Equivalent, Tungsten

APPENDIX 3

STRATEGIC AND CRITICAL MATERIALS STOCK PILING ACT

(P.L. 96-41, 50 U.S.C. 98 *et seq.*) as of September 30, 1985

SEC. 1. This Act may be cited as the 'Strategic and Critical Materials Stock Piling Act'.

FINDINGS AND PURPOSE

SEC. 2. (a) The Congress finds that the natural resources of the United States in certain strategic and critical materials are deficient or insufficiently developed to supply the military, industrial, and essential civilian needs of the United States for national defense.

(b) It is the purpose of this Act to provide for the acquisition and retention of stocks of certain strategic and critical materials and to encourage the conservation and development of sources of such materials within the United States and thereby to decrease and to preclude, when possible, a dangerous and costly dependence by the United States upon foreign sources for supplies of such materials in times of national emergency.

MATERIALS TO BE ACQUIRED; PRESIDENTIAL AUTHORITY AND GUIDELINES

SEC. 3. (a) The President shall determine from time to time (1) which materials are strategic and critical materials for the purposes of this Act, and (2) the quality and quantity of each such material to be acquired for the purposes of this Act and the form in which each such material shall be acquired and stored. Such materials when acquired, together with the other materials described in section 4 of this Act, shall constitute and be collectively known as the National Defense Stockpile (hereinafter in this Act referred to as the 'stockpile').

(b) The President shall make the determinations required to be made under subsection (a) on the basis of the following principles:

(1) The purpose of the stockpile is to serve the interest of national defense only and is not to be used for economic or budgetary purposes.

(2) The quantities of the materials stockpiled should be sufficient to sustain the United

States for a period of not less than three years in the event of a national emergency.

(c) The quantity of any material to be stockpiled under this Act, as determined under subsection (a), may not be revised unless the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed revision and the reasons for such revision at least 30 days before the effective date of such revision.

MATERIALS CONSTITUTING THE NATIONAL DEFENSE STOCKPILE

SEC. 4. (a) The stockpile consists of the following materials:

(1) Materials acquired under this Act and contained in the national stockpile on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(2) Materials acquired under this Act on or after the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(3) Materials in the supplemental stockpile established by section 104(b) of the Agricultural Trade Development and Assistance Act of 1954 (as in effect from September 21, 1959, through December 31, 1966) on the day before the date of the enactment of the Strategic and Critical Materials Stock Piling Revision Act of 1979.

(4) Materials acquired by the United States under the provisions of section 303 of the Defense Production Act of 1950 (50 U.S.C. App. 2093) and transferred to the stockpile by the President pursuant to subsection (f) of such section.

(5) Materials transferred to the United States under section 663 of the Foreign Assistance Act of 1961 (22 U.S.C. 2423) that have been determined to be strategic and critical materials for the purposes of this Act and that are allocated by the President under subsection (b) of such section for stockpiling in the stockpile.

(6) Materials acquired by the Commodity Credit Corporation and transferred to the stockpile under section 4(h) of the Commodity Credit Corporation Charter Act (15 U.S.C. 714b(h)).

(7) Materials acquired by the Commodity Credit Corporation under paragraph (2) of section 103(a) of the Act entitled 'An Act to provide for greater stability in agriculture; to augment the marketing and disposal of agricultural products; and for other purposes', approved August 28, 1954 (7 U.S.C. 1743(a)), and transferred to the stockpile under the third sentence of such section.

(8) Materials transferred to the stockpile by the President under paragraph (4) of section 103(a) of such Act of August 28, 1954.

(9) Materials transferred to the stockpile under subsection (b).

(b) Notwithstanding any other provision of law, any material that (1) is under the control of any department or agency of the United States, (2) is determined by the head of such department or agency to be excess to its needs and responsibilities, and (3) is required for the stockpile shall be transferred to the stockpile. Any such transfer shall be made without reimbursement to such department or agency, but all costs required to effect such transfer shall be paid or reimbursed from funds appropriated to carry out this Act.

AUTHORITY FOR STOCKPILE OPERATIONS

SEC. 5. (a) (1) Except for acquisitions made under the authority of paragraph (3) or (4) of section 6(a), no funds may be obligated or appropriated for acquisition of any material under this Act unless funds for such acquisition have been authorized by law. Funds appropriated for such acquisition (and for transportation and other incidental expenses related to such acquisition) shall remain available until expended, unless otherwise provided in appropriation Acts.

(2) If for any fiscal year the President proposes certain stockpile transactions in the annual materials plan submitted to Congress for that year under section 11(b) and after that plan is submitted the President proposes (or Congress requires) a significant change in any such transaction, or a significant

transaction not included in such plan, no amount may be obligated or expended for such transaction during such year until the President has submitted a full statement of the proposed transaction to the appropriate committees of Congress and a period of 30 days has passed from the date of the receipt of such statement by such committees or until each such committee, before the expiration of such period, notifies the President that it has no objection to the proposed transaction. In computing any 30-day period for the purpose of the preceding sentence, there shall be excluded any day on which either House of Congress is not in session because of an adjournment of more than three days to a day certain.

(b) Except for disposals made under the authority of paragraph (4) or (5) of section 6(a) or under section 7(a), no disposal may be made from the stockpile (1) unless such disposal, including the quantity of the material to be disposed of, has been specifically authorized by law, or (2) if the disposal would result in there being an unobligated balance in the National Defense Stockpile Transaction Fund in excess of \$250,000,000.

(c) There is authorized to be appropriated such sums as may be necessary to provide for the transportation, processing, refining, storage, security, maintenance, rotation, and disposal of materials contained in or acquired for the stockpile. Funds appropriated for such purposes shall remain available to carry out the purposes for which appropriated for a period of two fiscal years, if so provided in appropriation Acts.

STOCKPILE MANAGEMENT

SEC. 6. (a) The President shall—

(1) acquire the materials determined under section 3(a) to be strategic and critical materials;

(2) provide for the proper storage, security, and maintenance of materials in the stockpile;

(3) provide for the refining or processing of any material in the stockpile when necessary to convert such material into the form most suitable for storage and subsequent disposition;

(4) provide for the rotation of any material in the stockpile when necessary to prevent deterioration of such material by replacement of such material with an equivalent quantity of substantially the same material;

(5) subject to the notification required by subsection (d)(2), provide for the timely disposal of materials in the stockpile that (A) are excess to stockpile requirements, and (B) may cause a loss to the Government if allowed to deteriorate; and

(6) subject to the provisions of section 5(h), dispose of materials in the stockpile the disposal of which is specifically authorized by law.

(b) Except as provided in subsections (c) and (d), acquisition of strategic and critical materials under this Act shall be made in accordance with established Federal procurement practices, and, except as provided in subsections (c) and (d) and in section 7(a), disposal of materials from the stockpile shall be made by formal advertising or competitive negotiation procedures. To the maximum extent feasible—

(1) competitive procedures shall be used in the acquisition and disposal of such materials;

(2) efforts shall be made in the acquisition and disposal of such materials to avoid undue disruption of the usual markets of producers, processors, and consumers of such materials and to protect the United States against avoidable loss; and

(3) disposal of such materials shall be made for domestic consumption.

(c)(1) The President shall encourage the use of barter in the acquisition of strategic and critical materials for, and the disposal of materials from, the stockpile when acquisition or disposal by barter is authorized by law and is practical and in the best interest of the United States.

(2) Materials in the stockpile, the disposition of which is authorized by law, shall be available for transfer at fair market value as payment for expenses (including transportation and other incidental expenses) of acquisition of materials, or of refining, processing, or rotating materials, under this Act.

(3) To the extent otherwise authorized by law, property owned by the United States may be bartered for materials needed for the stockpile.

(d)(1) The President may waive the applicability of any provision of the first sentence of subsection (b) to any acquisition of material for, or disposal of material from, the stockpile. Whenever the President waives any such provision with respect to any such acquisition or disposal, or whenever the President determines that the application of paragraph (1), (2), or (3) of such subsection to a particular acquisition or disposal is not feasible, the President shall notify the Committees on Armed Services of the Senate and House of Representatives in writing of the proposed acquisition or disposal at least thirty days before any obligation of the United States is incurred in connection with such acquisition or disposal and shall include in such notification the reasons for not complying with any provision of such subsection.

(2) Materials in the stockpile may be disposed of under subsection (a)(5) only if the Committees on Armed Services of the Senate and House of Representatives are notified in writing of the proposed disposal at least thirty days before any obligation of the United States is incurred in connection with such disposal.

(e) The President may acquire leasehold interests in property, for periods not in excess of twenty years, for storage, security, and maintenance of materials in the stockpile.

SPECIAL DISPOSAL AUTHORITY OF THE PRESIDENT

SEC. 7. (a) Materials in the stockpile may be released for use, sale, or other disposition—

(1) on the order of the President, at any time the President determines the release of such materials is required for purposes of the national defense; and

(2) in time of war declared by the Congress or during a national emergency, on the order of any officer or employee of the United States designated by the President to have authority to issue disposal orders under this subsection, if such officer or employee determines that the release of such materials is required for purposes of the national defense.

(b) Any order issued under subsection (a) shall be promptly reported by the President, or by the officer or employee issuing such order, in writing, to the

Committees on Armed Services of the Senate and House of Representatives.

MATERIALS DEVELOPMENT AND RESEARCH

SEC. 8. (a)(1) The President shall make scientific, technologic, and economic investigations concerning the development, mining, preparation, treatment, and utilization of ores and other mineral substances that (A) are found in the United States, or in its territories or possessions, (B) are essential to the national defense, industrial, and essential civilian needs of the United States, and (C) are found in known domestic sources in inadequate quantities or grades.

(2) Such investigations shall be carried out in order to—

(A) determine and develop new domestic sources of supply of such ores and mineral substances;

(B) devise new methods for the treatment and utilization of lower grade reserves of such ores and mineral substances; and

(C) develop substitutes for such essential ores and mineral products.

(3) Investigations under paragraph (1) may be carried out on public lands and, with the consent of the owner, on privately owned lands for the purpose of exploring and determining the extent and quality of deposits of such minerals, the most suitable methods of mining and beneficiating such minerals, and the cost at which the minerals or metals may be produced.

(b) The President shall make scientific, technologic, and economic investigations of the feasibility of developing domestic sources of supplies of any agricultural material or for using agricultural commodities for the manufacture of any material determined pursuant to section 3(a) of this Act to be a strategic and critical material or substitutes therefor.

NATIONAL DEFENSE STOCKPILE TRANSACTION FUND

SEC. 9. (a) There is established in the Treasury of the United States a separate fund to be known as

the National Defense Stockpile Transaction Fund (hereinafter in this section referred to as the 'fund').

(b)(1) All moneys received from the sale of materials in the stockpile under paragraphs (5) and (6) of section 6(a) shall be covered into the fund. Such moneys shall remain in the fund until appropriated.

(2) Moneys covered into the fund under paragraph (1) shall be available, when appropriated therefor, only for the acquisition of strategic and critical materials under section 6(a)(1) of this Act (and for transportation related to such acquisition).

(3) Moneys in the fund, when appropriated, shall remain available until expended, unless otherwise provided in appropriation Acts.

(c) All moneys received from the sale of materials being rotated under the provisions of section 6(a)(4) or disposed of under section 7(a) shall be covered into the fund and shall be available only for the acquisition of replacement materials.

ADVISORY COMMITTEES

SEC. 10. (a) The President may appoint advisory committees composed of individuals with expertise relating to materials in the stockpile or with expertise in stockpile management to advise the President with respect to the acquisition, transportation, processing, refining, storage, security, maintenance, rotation, and disposal of such materials under this Act.

(b) Each member of an advisory committee established under subsection (a) while serving on the business of the advisory committee away from such member's home or regular place of business shall be allowed travel expenses, including per diem in lieu of substance, as authorized by section 5703 of title 5, United States Code, for persons intermittently employed in the Government service.

REPORTS TO CONGRESS

SEC. 11. (a) The President shall submit to the Congress every six months a written report detailing operations under this Act. Each such report shall include—

(1) information with respect to foreign and domestic purchases of materials during the preceding 6-month period;

(2) information with respect to the acquisition and disposal of materials under this Act by barter, as provided for in section 6(c) of this Act, during such period;

(3) a statement and explanation of the financial status of the National Defense Stockpile Transaction Fund and the anticipated appropriations to be made from the fund during the next fiscal year; and

(4) such other pertinent information on the administration of this Act as will enable the Congress to evaluate the effectiveness of the program provided for under this Act and to determine the need for additional legislation.

(b) The President shall submit to the appropriate committees of the Congress each year with the Budget submitted to Congress pursuant to Section 201(a) of the Budget and Accounting Act, 1921 (31 U.S.C. 11(a)), for the next fiscal year a report containing an annual materials plan for the operation of the stockpile during such fiscal year and the succeeding four fiscal years. Each such report shall include details of planned expenditures for acquisition of strategic and critical materials during such period (including expenditures to be made from appropriations from the general fund of the Treasury) and of anticipated receipts from proposed disposals of stockpile materials during such period.

DEFINITIONS

SEC. 12. For the purposes of this Act:

(1) The term 'strategic and critical materials' means materials that (A) would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and (B) are not found or produced in the United States in sufficient quantities to meet such need.

(2) The term 'national emergency' means a general declaration of emergency with respect to the national defense made by the President or by the Congress.

SEC. 13. Notwithstanding any other provision of law, on and after January 1, 1972, the President may not prohibit or regulate the importation into the United States of any material determined to be strategic and critical pursuant to the provisions of this Act, if such material is the product of any foreign country or area not listed as a Communist-dominated country or area in general headnote 3(d) of the Tariff Schedules of the United States (19 U.S.C. 1202), for so long as the importation into the United States of material of that kind which is the product of such Communist-dominated countries or areas is not prohibited by any provision of law.

APPENDIX 4

EXECUTIVE ORDER 12155—STRATEGIC AND CRITICAL MATERIALS

Source: The provisions of Executive Order 12155 of Sept. 10, 1979, appear at 44 FR 53071, 3 CFR, 1979 Comp., p. 426, unless otherwise noted.

By the authority vested in me as President of the United States of America by the Strategic and Critical Materials Stock Piling Act, as amended (50 U.S.C. 98 *et seq.*), and by Section 301 of Title 3 of the United States Code, and in order to provide for the performance of certain functions previously performed by agencies pursuant to their own authority, it is hereby ordered, effective July 30, 1979, as follows:

1-101. The functions vested in the President by Section 3 of the Strategic and Critical Materials Stock Piling Act, as amended, hereinafter referred to as the Act, (50 U.S.C. 98b), are delegated to the Director of the Federal Emergency Management Agency.

1-102. The functions vested in the President by Section 6 of the Act (50 U.S.C. 98c) are delegated to the Administrator of General Services.

1-103. (a) The functions vested in the President by Section 8(a) of the Act (50 U.S.C. 98g(a)) are delegated to the Secretary of the Interior.

(b) The functions vested in the President by Section 8(b) of the Act (50 U.S.C. 98g(b)) are delegated to the Secretary of Agriculture.

1-104. The functions vested in the President by Section 10 of the Act (50 U.S.C. 98h-1) are delegated to the Administrator of General Services.

1-105. The functions vested in the President by Section 11 of the Act (50 U.S.C. 98h-2) are delegated to the Director of the Federal Emergency Management Agency. The Secretaries of the Interior and of Agriculture and the Administrator of General Services shall submit biannually a written report to the Director. The report shall detail their performance of functions under the Act and this Order.

1-106

[Sec. 1-106 amends EO 12148 of July 20, 1979, this chapter, p. 806. The amendments have been incorporated into that order.]

1-107. The functions vested in the President by Section 5(a)(2) of the Act, as amended (50 U.S.C. 98d), are delegated to the Director of the Federal Emergency Management Agency.

[Sec. 1-107 added by EO 12417 of May 2, 1983, 48 FR 20035, 3 CFR, 1983 Comp., p. 186.]

APPENDIX 5

THE WHITE HOUSE Office of the Press Secretary

For Immediate Release

July 8, 1985

NATIONAL DEFENSE STOCKPILE POLICY

BACKGROUND

The President has decided to propose a modernization of the National Defense Stockpile of strategic materials. This proposal comes after 2 years of interagency study and thousands of hours of review at the staff and policy levels at twelve different agencies. The Administration intends to consult and work with the Congress on this important national security program before the new stockpile goals are transmitted.

The National Defense Stockpile is a reserve of non-fuel materials that the United States would require in a conflict, but that might not be available in sufficient quantities from domestic or reliable foreign sources. The previous Administration in 1979 calculated the United States' stockpile needs to be \$16.3 billion for 62 materials using May 1985 prices. Toward this goal, the stockpile contains \$6.6 billion in materials. The USG possesses an additional \$3.5 billion of materials that are surplus to our requirements under the 1979 goals. Thus, unmet materials needs are \$9.7 billion under the 1979 goals.

The President's April 5, 1982, "National Materials and Minerals Program Plan and Report to Congress" announced "a major interdepartmental effort to improve the Nation's preparedness for national mobilization." Part of the review was to address the potential national security impacts of shortages of strategic and critical materials. The review covered the 42 most significant materials in the stockpile. The remaining materials will be reviewed at a later date.

The key elements of the Nation's stockpile policy are as follows:

- The National Defense Stockpile will be sufficient to meet the military, industrial and essential

civilian needs for a 3-year conventional global military conflict, as mandated by Congress in 1979.

- The conflict scenario used is to be consistent with the scenarios developed by DOD.
- The stockpile should reflect detailed analyses regarding the conflict period: essential civilian, industrial and defense mobilization requirements, foreign trade patterns, shipping losses, petroleum availability, and foreign and domestic demand and production levels for the materials in question.

POLICY DECISIONS

On the basis of the new stockpile study of materials requirements and supplies during a protracted military conflict, the President has decided that the stockpile for the 42 materials studied will now contain \$6.7 billion in materials and include two tiers.

Goals of \$.7 billion (Tier I) are proposed for materials that would be required during a protracted military conflict that would not be available in sufficient quantities from domestic or reliable foreign sources. The stockpile also will contain a Supplemental Reserve of strategic and critical materials currently valued at \$6 billion (Tier II). The Supplemental Reserve will contain materials that the USG already possesses. This reserve will offer additional assurance against materials shortages during a period of military conflict. Both Tiers of stockpile provide over one year's peacetime levels of imports for such materials as chromium, manganese, cobalt and tantalum. These new stockpile goals will eliminate the \$9.7 billion unmet goal.

The new stockpile will result in surplus materials of \$3.2 billion, as opposed to the \$3.5 billion surplus calculated by the previous Administration. The mix of materials considered to be surplus, however, is different.

The President has decided to sell a portion (\$2.5 billion out of \$3.2 billion) of the surplus materials stocks in a manner—over the next five years—that minimizes market impacts. An interagency group will evaluate ways to ensure that stockpile sales do no cause undue market disruptions.

Receipts from the sales program will go to fill unmet materials goals under the 1984 study, including any goals that may result from analyses of the twenty materials yet to be studied, including any new, high-technology materials; the remainder will go to reduce the deficit. The stockpile goals planning assumptions also will be used for other appropriate mobilization preparedness areas.

STUDY PROCESS

The 1984 stockpile study completed by the Administration included a review of the analysis,

methods and assumptions used by the previous Administration in the 1979 study. This review concluded that a number of basic errors and unrealistic assumptions were used in the 1979 study. The present study relied on more realistic assumptions regarding oil availability, essential civilian requirements and domestic materials production. The new stockpile, unlike the one proposed in 1979, does not reflect the stockpiling of materials to ensure non-essential consumer production in a protracted military conflict. The stockpile does reflect essential civilian goods production with per capita consumption at more than twice the WW II level.

In the 1984 study, substantial improvements were made in analytic methods for estimating material requirements and available supply. These changes, the correction of errors and the use of more plausible assumptions, are the primary reasons for the revised goals. The 1984 study was started in 1983 and relied on actual data up to and including 1982 for all phases of the analysis. In all areas, the latest, best available data was used. By contrast, the previous 1979 stockpile goals relied on 1967 data in many cases.

STOCKPILE GOALS*

Commodity	Goal (\$M)	Quantities
Beryllium Concentrate		
Antimony	\$ 12.6	4,585 ST
Bauxite		
Bauxite, Refractory Grade		
Bauxite, Abrasive Grade		
Bismuth		
Cadmium		
Chromium	84.9	200 TH ST
Cobalt	245.0	22.57 M lbs.
Columbium		
Copper		
Diamond, Industrial, Stones		
Fluorspar		
Germanium	154.8	146,049.4 kg
Graphite, Ceylon	9.9	5,085.5 ST
Graphite, Malagasy	42.0	13,995.9 ST
Graphite, Other	1.6	2,237.1 ST
Iodine		
Lead		
Manganese		
Mercury (Mine)		
Mica, Muscovite Block	1.3	246.4 TH lbs.
Mica, Muscovite Film	0.2	18.7 TH lbs.
Mica, Muscovite Split	21.6	14,391.1 TH lbs.
Mica, Phlogopite Block	0.5	85.0 TH lbs.
Mica, Phlogopite Split	1.0	482.6 TH lbs.
Molybdenum		
Nickel		
Platinum Group, Iridium		
Platinum Group, Palladium		
Platinum Group, Platinum		
Quartz Crystal, Natural	0.2	26.5 TH lbs.
Rubber		
Rutile		
Silicon Carbide		
Silver		
Tantalum	72.1	1,900.7 TH lbs.
Tin		
Titanium	43.3	3.9 TH ST
Tungsten		
Vanadium		
Zinc		
	\$691.0	

*Goal value based on May 31, 1985, market prices.

SUPPLEMENTAL RESERVE

Commodity	Value (\$M)*	Quantities
Aluminum Oxide, Abrasive Grain Group	65	208,139 ST Ab Grain Eq.
Bauxite	828	4,278,912 ST Al Metal Eq.
Bauxite, Refractory Grade	52	274,926 LCT
Beryllium	164	437 ST Be Metal Eq.
Chromite, Refractory Grade	18	180,000 SDT
Chromium	756	594,123 ST Cr Metal Eq.
Cobalt	65	6 million Lbs Co
Columblum	19	2,532,419 lb Cb Metal Eq.
Copper	46	29,048 ST
Diamonds, Industrial Stones	205	7,950,000 KT
Graphite, Ceylon (415 ST)	1	415 ST
Iodine	31	5.5 million Lbs
Lead	123	300,000 ST
Manganese	369	869,667 ST Mn Metal Eq.
Mica, Muscovite Block	1	200,000 Lbs
Quartz, Crystals	11	1.8 million Lbs
Electrolytic Nickel	24	5,000 ST
Rubber	116	127,455 MT
Silver	543	87,500,000 Tr Oz
Tantalum	84	1,023,320 lbs Ta Metal Eq.
Tin	1,814	150,000 MT
Titanium	233	21.1 TH ST
Tungsten	298	52,215,245 Lb W Metal Eq.
Vanadium	8	722 ST V Metal
Zinc	81	85,000 ST
	\$5,955	

*Value based on May 31, 1985 prices.

